

## PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

## PCT

## NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

BLK

KELLY, Beth, L.  
 Townsend and Townsend and Crew LLP  
 Two Embarcadero Center  
 8th Floor  
 San Francisco, CA 94111  
 ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year)  
 29 January 2004 (29.01.2004)

Applicant's or agent's file reference

19957-159-3P

019957-015930PC

## IMPORTANT NOTICE

International application No.

PCT/US2003/023057

International filing date (day/month/year)

23 July 2003 (23.07.2003)

Priority date (day/month/year)

23 July 2002 (23.07.2002)

Applicant

NEOSE TECHNOLOGIES, INC. et al

- Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this notice:

AU, AZ, BY, CH, CN, CO, DE, DZ, EP, HU, JP, KG, KP, KR, MD, MK, MZ, RU, TM, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

- The following designated Offices have waived the requirement for such a communication at this time:

AE, AG, AL, AM, AP, AT, BA, BB, BG, BR, BZ, CA, CR, CU, CZ, DK, DM, EA, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, ID, IL, IN, IS, KE, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MG, MN, MW, MX, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, SC, SD, SE, SG, SK, SL, SY, TJ, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

- Enclosed with this notice is a copy of the international application as published by the International Bureau on 29 January 2004 (29.01.2004) under No. WO 2004/009838

## 4. TIME LIMITS for filing a demand for international preliminary examination and for entry into the national phase

The applicable time limit for entering the national phase will, subject to what is said in the following paragraph, be 30 MONTHS from the priority date, not only in respect of any elected Office if a demand for international preliminary examination is filed before the expiration of 19 months from the priority date, but also in respect of any designated Office, in the absence of filing of such demand, where Article 22(1) as modified with effect from 1 April 2002 applies in respect of that designated Office. For further details, see *PCT Gazette* No. 44/2001 of 1 November 2001, pages 19926, 19932 and 19934, as well as the *PCT Newsletter*, October and November 2001 and February 2002 issues.

*123-65* *3-23-01*  
 In practice, time limits other than the 30-month time limit will continue to apply, for various periods of time, in respect of certain designated or elected Offices. For regular updates on the applicable time limits (20, 21, 30 or 31 months, or other time limit), Office by Office, refer to the *PCT Gazette*, the *PCT Newsletter* and the *PCT Applicant's Guide*, Volume II, National Chapters, all available from WIPO's Internet site, at <http://www.wipo.int/pct/en/index.html>.

For filing a demand for international preliminary examination, see the *PCT Applicant's Guide*, Volume I/A, Chapter IX. Only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

It is the applicant's sole responsibility to monitor all these time limits.

*CJW*

The International Bureau of WIPO  
 34, chemin des Colombettes  
 1211 Geneva 20, Switzerland

Authorized officer

Gijsbertus Beijer - Carlos Roy

Facsimile No.(41-22) 740.14.35

Telephone No.(41-22) 338.91.11

## PATENT COOPERATION TREATY

From the RECEIVING OFFICE

To:

BETH L. KELLY  
 TOWNSEND AND TOWNSEND AND CREW LLP  
 TWO EMBARCADERO CENTER  
 8TH FLOOR  
 SAN FRANCISCO, CALIFORNIA 94111-3834

019957-015920PC

PCT

INVITATION TO CORRECT DEFECTS IN  
THE INTERNATIONAL APPLICATION

(PCT Articles 3(4)(i) and 14(1) and Rule 26)

Date of mailing (day/month/year)		29 Aug 2003
Applicant's or agent's file reference  19957-159-2	REPLY DUE within 1 months/days from 9-29-03 the above date of mailing	
International application No.  PCT/US03/23155	International filing date (day/month/year) 23 Jul 2003	
Applicant  NEOSE TECHNOLOGIES, INC.		

1.  The applicant is hereby invited, within the time limit indicated above, to correct, in the international application as filed, the defects specified on the attached:
  - Annex A
  - Annex B1 (*text matter of the international application as filed*)
  - Annex C1 (*drawings of the international application as filed*)
2.  The applicant is hereby invited, within the time limit indicated above, to correct, in the translation of the international application furnished under Rule 12.3 or 12.4, the defects specified on the attached:
  - Annex A
  - Annex B2 (*text matter of the translation of the international application*)
  - Annex C2 (*drawings of the translation of the international application*)

## Additional observations (if necessary):

## HOW TO CORRECT THE DEFECTS?

Correction must be submitted by filing a replacement sheet embodying the correction and a letter accompanying the replacement sheet, which shall draw attention to the difference between the replaced sheet and the replacement sheet. A correction may be stated in a letter only if it is of such a nature that it can be transferred from the letter to the record copy without adversely affecting the clarity and direct reproducibility of the sheet onto which the correction is to be transferred (Rule 26.4).

## ATTENTION

Failure to correct the defects will result in the international application being considered withdrawn by this receiving Office (see Rule 26.5 for further details).

A copy of this invitation and any attachments has been sent to the International Bureau

and the International Searching Authority

Name and mailing address of the receiving Office  Mail Stop PCT, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450  Facsimile No. 703-305-3230	Authorized officer  Sigfried Hostad  Telephone No. 703-305-3680
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Form PCT/RO/106 (January 2003)

Power of Attorney 9-29-03  
DOCKETED BY CW

The receiving Office has found the following defects in the international application as filed:

1. As to signature\* of the international application (Rules 4.15 and 90.4), the request:
  - a.  is not signed
  - b.  is not signed by all the applicants
  - c.  is not accompanied by the statement referred to in the check list in Box No. VIII of the request explaining the lack of the signature of an applicant for the designation of the United States of America
  - d.  is signed by what appears to be an agent/common representative but:
    - the international application is not accompanied by a power of attorney appointing him
    - the power of attorney accompanying the international application was not signed by all the applicants
  - e.  other (*specify*):

\* All applicants must sign, including inventors if they are also applicants (e.g. where the United States of America is designated).

2. As to indications concerning the applicant, the request (Rules 4.4 and 4.5):
  - a.  does not properly indicate the applicant's name (*specify*):
  - b.  does not indicate the applicant's address
  - c.  does not properly indicate the applicant's address (*specify*):
  - d.  does not indicate the applicant's nationality
  - e.  does not indicate the applicant's residence
  - f.  other (*specify*):
3. As to the language of certain elements of the international application, other than the description and claims (Rules 12.1(c) and 26.3ter(a) and (c)):
  - a.  the request is not in a language of publication accepted by this receiving Office; (the) language(s) accepted by this receiving Office is/are:
  - b.  the text matter of the drawings is not in the language in which the international application is to be published, which is:
  - c.  the abstract is not in the language in which the international application is to be published, which is:
4. The title of the invention:
  - a.  is not indicated in Box No. I of the request (Rule 4.1(a))
  - b.  is not indicated at the top of the first sheet of the description (Rule 5.1(a))
  - c.  as appearing in Box No. I of the request is not identical with the title heading the description (Rule 5.1(a))
5. As to the abstract (Rule 8):
  - the international application does not contain an abstract

10 Recd PCT/PW 12 JAN 2005

From the INTERNATIONAL SEARCHING AUTHORITY

To:

BETH L. KELLY  
 TOWNSEND AND TOWNSEND AND CREW LLP  
 TWO EMBARCADERO CENTER  
 8TH FLOOR  
 SAN FRANCISCO, CALIFORNIA 94111-3834

019957-015920 PC

PCT

NOTIFICATION OF RECEIPT  
OF SEARCH COPY

(PCT Rule 25.1)

Applicant's or agent's file reference 19957-159-2		Date of mailing (day/month/year) 29 Aug 2003
IMPORTANT NOTIFICATION		
International application No. PCT/US03/23155	International filing date (day/month/year) 23 Jul 2003	Priority date (day/month/year) 23 Jul 2002
Applicant NEOSE TECHNOLOGIES, INC.		

## 1. Where the International Searching Authority and the receiving Office are not the same Office:

The applicant is hereby notified that the search copy of the international application was received by this International Searching Authority on the date indicated below.

## Where the International Searching Authority and the receiving Office are the same Office:

The applicant is hereby notified that the search copy of the international application was received on the date indicated below.

29 Aug 2003

(date of receipt).

2.  The search copy was accompanied by a nucleotide and/or amino acid sequence listing in computer readable form.

## 3. Time limit for establishment of international search report

The applicant is informed that the time limit for establishing the international search report is 3 months from the date of receipt indicated above or 9 months from the priority date, whichever time limit expires later.

4. A copy of this notification has been sent to the International Bureau and, where the first sentence of paragraph 1 applies, to the receiving Office.

Name and mailing address of the ISA/ Mail Stop PCT, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 703-305-3230	Authorized officer Siegfried Hostad Telephone No. 703-305-3680
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CW

TO RECD FROM

12 JAN 2005

<b>TO:</b> BETH L. KELLY TOWNSEND AND TOWNSEND AND CREW LLP TWO EMBARCADERO CENTER 8TH FLOOR SAN FRANCISCO, CALIFORNIA 94111-3834	UNITED STATES - DESIGNATED/ELECTED OFFICE (DO/EO/US)	
	<b>NOTIFICATION OF STATUS OF REQUIREMENTS UNDER 35 U.S.C. 371</b>	
	DATE OF MAILING (day/month/year)	29 Aug 2003
	FILE REFERENCE	19957-159-2

**IDENTIFICATION OF INTERNATIONAL APPLICATION**

International application No.	International filing date (day/month/year)	Priority Date Claimed
PCT/US03/23155	23 Jul 2003	23 Jul 2002

**Applicant for DO/EO/US**

JOHNSON, KARL, F.

**NOTIFICATION**

The applicant is hereby advised that the U.S. Patent and Trademark Office in its capacity as  Designated Office  Elected Office has received following items as of the date of mailing indicated above.

1.  U.S. Nation fee [35 U.S.C 371 (c) (1)]
  2.  Oath of declaration [35 U.S.C 371 (c) (4)]
  3.  Copy of International application as [35 U.S.C 371 (c) (2)]
  4.  Translation of Application [35 U.S.C 371 (c) (2)]
  5.  Amendments under PCT Article 19 [35 U.S.C 371 (c) (3)]
  6.  Translation of PCT Article 19 Amendments [35 U.S.C 371 (c) (3)]
  7.  Search Report or Declaration under PCT Article 17(2) [35 U.S.C 371 (a)]
  8.  International Preliminary Examination Report and its Annexes, if any, under PCT Article 36(3)(b) [35 U.S.C 371 (a)]
  9.  Translation of Annexes to the International Preliminary Examination Report under PCT Article 36(3)(b) [35 U.S.C 371 (c) (5)]
  10.  Other items received:
    - Assignment Document       Prior Art Statement       Preliminary Amendment
- A.  Requirements for U.S. National processing have been met. Processing will commence
  - at the expiration of the applicable time limit under either
    - PCT Article 22 [35 U.S.C 371 (b)] or
    - PCT Article 39 [35 U.S.C 371 (b)]
  - on the date indicated below under the provisions of 35 U.S.C 371 (f)

U.S. NATIONAL SERIAL#

DATE UNDER 35 U.S.C. 102(e)

DATE OF COMMENCEMENT  
OF NATIONAL PROCESSING

All correspondence submitted after the date of commencement of U.S. National processing indicated above should refer to the U.S. National Serial Number and the appropriate U.S. National processing organization of Officer.

- B.  As the above identified application has been accepted for U.S. National processing under the provision of 35 U.S.C.371 (f) before expiration of the applicable time limit under  PCT Article 22  PCT Article 39, applicant is reminded that
  - Amendments under PCT Article 19 and/or
  - the International Preliminary Examination Report and its Annexes, if any, under PCT Article 36(3) (a), and (b) and any translation thereof, if applicable, must be submitted to the Patent and Trademark Office as soon as they are available.

International application No.	International filing date	Priority Date Claimed
PCT/US03/23155	23 Jul 2003	23 Jul 2002

C.  In order that U.S. National processing may begin, certain items must be received by the DO/EO/US by the expiration of applicable time limit under

- PCT Article 22 or
- PCT Article 39.

Specifically:

- 1. U.S. National Fee
- 2. Oath or Declaration
- 3. Copy of Application
- 4. Translation of application
- 5. Amendments under PCT Article 19, if any
- 6. Translation of PCT Article 19 Amendments, if applicable
- 7. Search Report or PCT Article 17(2) declaration
- 8. International Preliminary Examination Report and its Annexes, if any, under PCT Article 36(3)(a), if applicable
- 9. Translation of Annexs to the International Preliminary Examination Report under PCT Article 36(3)(b), if applicable

**THE ABOVE CHECK ITEMS MUST BE TIMELY RECEIVED TO AVOID ABANDONMENT OF THE APPLICATION.  
(35. U.S.C. 371(d))**

D. Further information for the applicant:

**This is only a reminder.**

**UNITED STATES DESIGNATED/ELECTED OFFICE**

Address Only: Mail Stop PCT, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450	Authorized Officer Sigfried Hostad 703-305-3680
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*LNB*

## ATTENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

## PCT

NOTIFICATION RELATING TO  
DECLARATION MADE UNDER PCT RULE 4.17(PCT Rules 26ter.2(b), 47.1(a-ter) and 48.2(a)(x)  
and Administrative Instructions, Section 419)*019957-615970PC*

Date of mailing (day/month/year) 19 November 2003 (19.11.03)	To:  KELLY, Beth, L. Townsend and Townsend and Crew LLP Two Embarcadero Center 8th Floor San Francisco, CA 94111-3834 ETATS-UNIS D'AMERIQUE
Applicant's or agent's file reference 19957-159-2	<b>IMPORTANT NOTIFICATION</b>
International application No. PCT/US03/23155	International filing date (day/month/year) 23 July 2003 (23.07.03)
Applicant NEOSE TECHNOLOGIES, INC.	

1. The applicant is hereby notified of the following regarding the declaration indicated below in respect of (*name(s) indicated in the declaration*) Johnson, Bezila
  - (i)  declaration as to the identity of the inventor (Rules 4.17(i) and 51bis.1(a)(i) and Section 211)
  - (ii)  declaration as to the applicant's entitlement, as at the international filing date, to apply for or be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii) and Section 212)
  - (iii)  declaration as to the applicant's entitlement, as at the international filing date, to claim priority of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii) and Section 213)
  - (iv)  declaration of inventorship (for the purposes of the designation of the United States of America) (Rules 4.17(iv) and 51bis.1(a)(iv) and Section 214)
  - (v)  declaration as to non-prejudicial disclosures or exceptions to lack of novelty (Rules 4.17(v) and 51bis.1(a)(v) and Section 215)
2.  **Addition or correction of the declaration within the time limit under Rule 26ter.1.**

The added or corrected declaration was received on (*date*), 05 November 2003 which was received within the time limit under Rule 26ter.1.

Any declaration referred to under items 1(i) to (iv) whether or not the declaration complies with Rule 4.17, will be communicated to the designated Offices concerned pursuant to Rule 47.1(a-ter) and any declaration referred to under item 1(v) will be published as part of the pamphlet pursuant to Rule 48.2(a)(x).
3.  **Failure to add or correct the declaration within the time limit under Rule 26ter.1.**

The declaration, was received on (*date*), which was after the expiration of the time limit under Rule 26ter.1; therefore, any such declaration referred to under items 1(i) to (iv) will not be communicated to the designated Offices concerned, any such declaration referred to under item 1(v) will not be published as part of the pamphlet, and any signed declaration referred to under item 1(iv) is attached. Such declaration should be submitted by the applicant directly to the designated Offices concerned.
4. The applicant's attention is drawn to Rule 51bis.2 which provides that the designated Office shall not, unless it may reasonably doubt the veracity of the declaration concerned, require any document or evidence relating to the subject matter of any declaration complying with Rule 4.17(i) to (iv) which is contained in the request or submitted to the International Bureau or directly to the designated Office. Note, however, that Rule 51bis.2 may not apply in respect of certain States. For further information, see Notes to the request form, Box No. VIII.
5. A copy of this notification is being sent to the receiving Office and the International Searching and Examining AUTHORITY. *Correspondence in seal 11-23-03*

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 338.70.10	Authorized officer Jean-Marie MCADAMS (Fax 338 7010)  Telephone No. (41-22) 338.99.13
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## ATTENT COOPERATION TRE

*LJB*

PCT

**NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT**

(PCT Administrative Instructions, Section 411)

Date of mailing (day/month/year) <b>03 October 2003 (03.10.03)</b>	To:  KELLY, Beth, L. Townsend and Townsend and Crew LLP Two Embarcadero Center 8th Floor San Francisco, CA 94111-3834 United States of America		
Applicant's or agent's file reference <b>19957-159-2 OPQAS7-015920PC</b>	<b>IMPORTANT NOTIFICATION</b>		
International application No. <b>PCT/US03/23155</b>	International filing date (day/month/year) <b>23 July 2003 (23.07.03)</b>		
International publication date (day/month/year) <b>Not yet published</b>	Priority date (day/month/year) <b>23 July 2002 (23.07.02)</b>		
<p><b>Applicant</b> <b>NEOSE TECHNOLOGIES, INC. et al</b></p> <p>1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR" in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).  2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.  3. An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.  4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.</p>			
<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
23 July 2002 (23.07.02) 08 Nove 2002 (08.11.02)	60/398,156 60/424,894	US US	05 Sept 2003 (05.09.03) 09 Sept 2003 (09.09.03)
<i>11-23-03</i> <i>Priority Document</i> <i>UNDOCKETED BY CW</i>			

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 338.70.10	Authorized officer  Farid ABOU  Telephone No. (41-22) 338 8169
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## PATENT COOPERATION TREATY

*LJB*

PCT

**NOTIFICATION OF RECEIPT OF  
RECORD COPY**  
(PCT Rule 24.2(a))

From the INTERNATIONAL BUREAU

To:

KELLY, Beth, L.  
Townsend and Townsend and Crew LLP  
Two Embarcadero Center  
8th Floor  
San Francisco, CA 94111-3834  
United States of America

Date of mailing (day/month/year) 25 September 2003 (25.09.03)	<b>IMPORTANT NOTIFICATION</b>
Applicant's or agent's file reference 19957-159-2 <i>01957-615920PC</i>	International application No. PCT/US03/23155

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

NEOSE TECHNOLOGIES, INC. (for all designated States except US)  
JOHNSON, Karl, F. et al (for US)

International filing date : 23 July 2003 (23.07.03) /  
Priority date(s) claimed : 23 July 2002 (23.07.02) /  
08 November 2002 (08.11.02) /

Date of receipt of the record copy by the International Bureau : 05 September 2003 (05.09.03)

List of designated Offices :

AP : GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW  
EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
EP : AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR  
OA : BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG  
National : AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

*10-23-03*

*Confirm Designations*  
*UNDOCKETED BY CW*

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer:  M. CHEVALLAY WORLEY (Fax 338 7010)
Facsimile No. (41-22) 338.70.10	Telephone No. (41-22) 338 8859

## Continuation of Form PCT/IB/301

## NOTIFICATION OF RECEIPT OF RECORD COPY

Date of mailing (day/month/year) 25 September 2003 (25.09.03)	<b>IMPORTANT NOTIFICATION</b>
Applicant's or agent's file reference 19957-159-2	International application No. PCT/US03/23155

**ATTENTION**

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

- time limits for entry into the national phase - see updated important information (as of April 2002)
- confirmation of precautionary designations (if applicable)
- requirements regarding priority documents (if applicable)

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

## INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated on the cover sheet of this Notification by paying national fees and furnishing translations, as prescribed by Articles 22 and 39 and the applicable national laws. In addition, the applicant may also have to comply with other special requirements applicable in certain Offices. It is the applicant's responsibility to ensure the necessary steps to enter the national phase are taken in a timely fashion. Most Offices do not issue reminders to applicants in connection with the entry into the national phase.

*2-23-04*  
 The applicable time limit for entering the national phase will, subject to what is said in the following paragraph, be 30 MONTHS from the priority date, not only in respect of any elected Office where a demand for international preliminary examination is filed before the expiration of 19 months from the priority date (see Article 39(1)), but also in respect of any designated Office, in the absence of filing of such demand, where Article 22(1) as modified with effect from 1 April 2002 applies in respect of that designated Office. For further details, see PCT Gazette No. 44/2001 of 1 November 2001, pages 19926, 19932 and 19934, as well as the PCT Newsletter, October and November 2001 and February 2002 issues.

*3-23-04*  
 In practice, time limits other than the 30-month time limit will continue to apply, for various periods of time, in respect of certain designated or elected Offices. For regular updates on the applicable time limits (20, 21, 30 or 31 months, or other time limit), Office by Office, refer to the PCT Gazette ("Section IV" part published on a weekly basis), to the PCT Newsletter (on a monthly basis) and to the relevant National Chapters in Volume II of the PCT Applicant's Guide (the paper version of which is updated usually twice a year and the Internet version of which is updated usually on a weekly basis). Finally, a cumulative table of all applicable time limits for entering the national phase is available from WIPO's Internet site, via links from various pages of the site including those of the Gazette, Newsletter and Guide, at <http://www.wipo.int/pct/en/index.html>.

Information about the requirements for filing a demand for international preliminary examination is set out in the PCT Applicant's Guide, Volume I/A, Chapter IX. Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

## CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date (this time limit may not be extended). If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. The Notice of confirmation and payment must reach the receiving Office within the 15-month time limit.

## REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents, the following is recalled.

Where the priority of an earlier national, regional or international application is claimed, the applicant must submit a copy of the said earlier application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date, provided that any such priority document may still be submitted to the International Bureau before that date of international publication of the international application, in which case that document will be considered to have been received by the International Bureau on the last day of the 16-month time limit (Rule 17.1(a)).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request must be made before the expiration of the 16-month time limit and may be subjected by the receiving Office to the payment of a fee (Rule 17.1(b)).

If the priority document concerned is not submitted to the International Bureau or if the request to the receiving Office to prepare and transmit the priority document has not been made (and the corresponding fee, if any, paid) within the applicable time limit indicated under the preceding paragraphs, any designated State may disregard the priority claim, provided that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within the time limit which is reasonable under the circumstances.

Where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

LBB

## PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

## PCT

INVITATION TO CORRECT  
DECLARATION(S) MADE IN THE REQUEST  
UNDER PCT RULE 4.17(PCT Rules 4.17 and 26ter.2(a))  
*DIG957-015920PC*Date of mailing  
(day/month/year) 25 September 2003 (25.09.03)Applicant's or agent's file reference  
19957-159-2International application No.  
PCT/US03/23155Applicant  
NEOSE TECHNOLOGIES, INC.

To:

KELLY, Beth, L.  
Townsend and Townsend and Crew LLP  
Two Embarcadero Center  
8th Floor  
San Francisco, CA 94111-3834  
ETATS-UNIS D'AMERIQUE

REPLY DUE

*11-23-03*

See below

International filing date  
(day/month/year)

23 July 2003 (23.07.03)

1. The applicant is hereby invited to submit to the International Bureau a corrected declaration within the time limit indicated below and as explained in the Annex. The applicant's attention is drawn to the fact that the declaration has not been examined for compliance with national law requirements of the designated State(s) for which that declaration is made.

*11-23-03*

**When?** Within 16 months from the priority date, provided that any corrected declaration which is received by the International Bureau after the expiration of that time limit shall be considered to have been received on the last day of that time limit if it reaches it before the technical preparations for international publication have been completed (Rule 26ter.1).

**How?** By submitting a replacement sheet containing a corrected declaration accompanied by a letter explaining the correction (see Section 216). See Sections 211 to 215 for the applicable standardized wording.

**Where?** Directly to the International Bureau at the address indicated below.  
If the corrected declaration is submitted to the receiving Office, that Office shall mark the date of receipt on it and transmit it promptly to the International Bureau. The declaration shall be considered to have been submitted to the International Bureau on the date marked (see Section 317).

2. Failure to correct the declaration within the time limit will result in copies of the declaration, as originally filed, being communicated by the International Bureau to the designated Offices concerned according to Rule 47.1 (a-ter).

Any declaration received after the expiration of the time limit under Rule 26ter.1 will have to be submitted by the applicant directly to the designated Offices concerned; it is only in the case of a signed declaration of inventorship for the purposes of the designation of the United States of America (Rule 4.17(iv)) that the original declaration will be returned to the applicant (see Section 419(d)).

3. In respect of national phase processing, the applicant's attention is drawn to Rule 51bis.2 which provides that the designated Office shall not, unless it may reasonably doubt the veracity of the declaration concerned, require any document or evidence relating to the subject matter of any declaration complying with Rule 4.17(i) to (iv) which is contained in the request or submitted to the International Bureau or directly to the designated Office. Note, however, that Rule 51bis.2 may not apply in respect of certain States. For further information, see Notes to the request form, Box No. VIII.
- Correct defects in Declaration*
4. A copy of this invitation is being sent to the receiving Office.

UNDOCKETED BY *9-26-03*

The International Bureau of WIPO 34, chemin des Colombettes, 1211 Geneva 20, Switzerland	Authorized officer M. CHEVALLAY WORLEY (Fax 338 7010) <i>[Signature]</i> Telephone No. (41-22) 338.88.59
Facsimile No. (41-22) 338.70.10	

The International Bureau has found the following defect(s) in the declaration(s) listed below :

1.  declaration as to the identity of the inventor (Rules 4.17(i) and 51bis.1(a)(i) and Section 211), in respect of:
  - a. *(name(s) included in the declaration):* .....  
 is not in the prescribed wording  
 other (*specify*): .....
  - b. *(name(s) included in the declaration):* .....  
 is not in the prescribed wording  
 other (*specify*): .....
2.  declaration as to the applicant's entitlement, as at the international filing date, to apply for or be granted a patent (Rules 4.17(ii) and 51.bis.1(a)(ii) and Section 212), in respect of:
  - a. *(name(s) included in the declaration):* .....  
 is not in the prescribed wording  
 other (*specify*): .....
  - b. *(name(s) included in the declaration):* .....  
 is not in the prescribed wording  
 other (*specify*): .....
3.  declaration as to the applicant's entitlement, as at the international filing date, to claim priority of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii) and Section 213), in respect of:
  - a. *(name(s) included in the declaration):* .....  
 is not in the prescribed wording  
 other (*specify*): .....
  - b. *(name(s) included in the declaration):* .....  
 is not in the prescribed wording  
 other (*specify*): .....
4.  declaration of inventorship (only for the purposes of the designation of the United States of America) (Rules 4.17(iv) and 51bis.1(a)(iv) and Section 214), in respect of:
  - a. *(name(s) included in the declaration):* JOHNSON, Karl, F.; BEZILA, Daniel,  
James.....  
 is not in the prescribed wording  
 is not signed by all inventors named in the declaration  
 other (*specify*): .....
  - b. *(name(s) included in the declaration):* .....  
 is not in the prescribed wording  
 is not signed by all inventors named in the declaration  
 other (*specify*): .....
5.  declaration as to non-prejudicial disclosures or exceptions to lack of novelty (Rules 4.17(v) and 51bis.1(a)(v) and Section 215), in respect of:
  - a. *(name(s) included in the declaration):* .....  
 is not in the prescribed wording  
 other (*specify*): .....
  - b. *(name(s) included in the declaration):* .....  
 is not in the prescribed wording  
 other (*specify*): .....

## PATENT COOPERATION TREATY

PCT

INFORMATION CONCERNING ELECTED  
OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

From the INTERNATIONAL BUREAU

To:

019957-015920PC

KELLY, Beth, L.  
 Townsend and Townsend and Crew LLP  
 Two Embarcadero Center  
 8th Floor  
 San Francisco, CA 94111-3834  
 United States of America

Date of mailing (day/month/year) 10 June 2004 (10.06.2004)
---

Applicant's or agent's file reference 19957-159-2
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## IMPORTANT INFORMATION

International application No. PCT/US2003/023155	International filing date (day/month/year) 23 July 2003 (23.07.2003)	Priority date (day/month/year) 23 July 2002 (23.07.2002)
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Applicant NEOSE TECHNOLOGIES, INC. et al
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1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

EP :AT,BE,BG,CH,CY,CZ,DE,DK,EE,ES,FI,FR,GB,GR,HU,IE,IT,LU,MC,NL,PT,RO,SE,  
 SI,SK,TR

National :BG,CA,CN,DE,GB,IL,JP,KP,KR,MN,NO,PL,RO,RU,SK,US

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

AP :GH,GM,KE,LS,MW,MZ,SD,SL,SZ,TZ,UG,ZM,ZW

EA :AM,AZ,BY,KG,KZ,MD,RU,TJ,TM

OA :BF,BJ,CF,CG,CI,CM,GA,GN,GQ,GW,ML,MR,NE,SN,TD,TG

National :AE,AG,AL,AM,AT,AU,AZ,BA,BB,BR,BY,BZ,CH,CO,CR,CU,CZ,DK,DM,DZ,EC,  
 EE,ES,FI,GD,GE,GH,GM,HR,HU,ID,IN,IS,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,  
 MG,MK,MW,MX,MZ,NI,NZ,OM,PG,PH,PT,SC,SD,SE,SG,SL,SY,TJ,TM,TN,TR,TT,TZ,UA,  
 UG,UZ,VC,VN,YU,ZA,ZM,ZW

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.

The International Bureau of WIPO  
 34, chemin des Colombettes  
 1211 Geneva 20, Switzerland

Facsimile No. (41-22) 338.70.10

Authorized officer:

Farid ABOU (Fax 338 7010)

Telephone No. (41-22) 338 8169

PATENT COOPERATION TREATY

2 JAN 2005

From the INTERNATIONAL BUREAU

PCT

To:

*BKL*

KELLY, Beth, L.  
Townsend and Townsend and Crew LLP  
Two Embarcadero Center  
8th Floor  
San Francisco, CA 94111-3834  
ETATS-UNIS D'AMERIQUE

*019957-015920PC*

5-13-04  
Publication of Search Report date  
DOCKETED BY Cina

LJB

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

KEVIN L. BASTIAN  
TOWNSEND AND TOWNSEND AND CREW LLP.  
TWO EMBARCADERO CENTER, EIGHT FLOOR  
SAN FRANCISCO, CALIFORNIA 94111-3834

**PCT**NOTIFICATION OF RECEIPT  
OF DEMAND BY COMPETENT INTERNATIONAL  
PRELIMINARY EXAMINING AUTHORITY(PCT Rules 59.3(e) and 61.1(b), first sentence  
and Administrative Instructions, Section 601(a))

019957-015920PC

Date of mailing  
(day/month/year)

08 APR 2004

Applicant's or agent's file reference 19957-159-2		IMPORTANT NOTIFICATION		
International application No. PCT/US03/23155✓	International filing date (day/month/year) 23 Jul 2003 ✓	Priority date (day/month/year) 23 Jul 2002 ✓		
Applicant NEOSE TECHNOLOGIES, INC. ✓				

1. The applicant is hereby notified that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

23 Feb 2004

2. That date of receipt is:

- the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
- the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).
- the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3.  ATTENTION: That date of receipt is AFTER the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the *PCT Applicant's Guide*, Volume II.

- (If applicable) This notification confirms the information given by telephone, facsimile transmission or in person on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/ Mail Stop PCT, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450  Facsimile No. 703-305-3230	Authorized officer Sigfried Hostad  Telephone No. 703-305-3680
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Form PCT/IPEA/402 (July 1998)

Chp 2 Demand 2-23-04  
Chp 1 nat'l phase 3-23-04  
PREVIOUSLY UNDOCKETED C7W

7-23-04  
PCT Demand Rec'd  
UNDOCKETED BY C7W

10 Rec'd PCT/PTO 12 JAN 2005  
TENT COOPERATION TREATY

WU 2004/009/93  
PCT/US2003/023155

From the INTERNATIONAL BUREAU

**PCT**

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

*BHK*

KELLY, Beth, L.  
Townsend and Townsend and Crew LLP  
Two Embarcadero Center  
8th Floor  
San Francisco, CA 94111-3834  
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 29 January 2004 (29.01.2004)
--

Applicant's or agent's file reference 19957-159-2
--

*019957-015920PC*

**IMPORTANT NOTICE**

International application No. PCT/US2003/023155	International filing date (day/month/year) 23 July 2003 (23.07.2003)	Priority date (day/month/year) 23 July 2002 (23.07.2002)
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Applicant NEOSE TECHNOLOGIES, INC. et al
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1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this notice:

AU, AZ, BY, CH, CN, CO, DE, DZ, EP, HU, JP, KG, KP, KR, MD, MK, MZ, RU, TM, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE, AG, AL, AM, AP, AT, BA, BB, BG, BR, BZ, CA, CR, CU, CZ, DK, DM, EA, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, ID, IL, IN, IS, KE, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MG, MN, MW, MX, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, SC, SD, SE, SG, SK, SL, SY, TJ, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this notice is a copy of the international application as published by the International Bureau on 29 January 2004 (29.01.2004) under No. WO 2004/009793

**4. TIME LIMITS for filing a demand for international preliminary examination and for entry into the national phase**

The applicable time limit for entering the national phase will, subject to what is said in the following paragraph, be 30 MONTHS from the priority date, not only in respect of any elected Office if a demand for international preliminary examination is filed before the expiration of 19 months from the priority date, but also in respect of any designated Office, in the absence of filing of such demand, where Article 22(1) as modified with effect from 1 April 2002 applies in respect of that designated Office. For further details, see *PCT Gazette* No. 44/2001 of 1 November 2001, pages 19926, 19932 and 19934, as well as the *PCT Newsletter*, October and November 2001 and February 2002 issues.

*1.23-05*

*3.23-04*

In practice, time limits other than the 30-month time limit will continue to apply, for various periods of time, in respect of certain designated or elected Offices. For regular updates on the applicable time limits (20, 21, 30 or 31 months, or other time limit), Office by Office, refer to the *PCT Gazette*, the *PCT Newsletter* and the *PCT Applicant's Guide*, Volume II, National Chapters, all available from WIPO's Internet site, at <http://www.wipo.int/pct/en/index.html>.

For filing a demand for international preliminary examination, see the *PCT Applicant's Guide*, Volume I/A, Chapter IX. Only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

It is the applicant's sole responsibility to monitor all these time limits.

*CJW*

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer
---	--------------------

Gijsbertus Beijer - Carlos Roy

No.(41-22) 740.14.35	Telephone No.(41-22) 338.91.11
----------------------	--------------------------------

.B/308 (April 2002)

10 Reg'd PCT/IPEA 12 JAN 2005

PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:  
KEVIN L. BASTIAN  
TOWNSEND AND TOWNSEND AND CREW LLP  
TWO EMBARCADERO CENTER  
8TH FLOOR  
SAN FRANCISCO, CA 94111-3834

BLK

PCT

WRITTEN OPINION

(PCT Rule 66)

019957-015920PC

05 AUG 2004

Applicant's or agent's file reference 19957-159-2.		Date of Mailing (day/month/year) 9/5/04	REPLY DUE within 1 months/days from the above date of mailing
International application No. PCT/US03/23155	International filing date (day/month/year) 23 July 2003 (23.07.2003)	Priority date (day/month/year) 23 July 2002 (23.07.2002)	
International Patent Classification (IPC) or both national classification and IPC IPC(7): C12Q 1/00, 1/48; C12P 1/00, 21/06, 19/18; C12N 9/00, 9/10, 9/12; A23J 1/00 and US Cl.: 435/4, 15, 41, 68.1, 97, 183, 193, 194; 530/412			
Applicant NEOSE TECHNOLOGIES, INC.			

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:

- I  Basis of the opinion
- II  Priority
- III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV  Lack of unity of invention
- V  Reasoned statement under Rule 66.2 (a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI  Certain documents cited
- VII  Certain defects in the international application
- VIII  Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension. See rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4. For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis. For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 23 November 2004 (23.11.2004).

Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Manjunath N. Rao, Ph.D. Telephone No. 703-306-0196
---	---

Form PCT/IPEA/408 (cover sheet)(July 1998)

Written Opinion recd  
Written Opinion response 9/5/04  
DOCKETED scr

**I. Basis of the opinion****1. With regard to the elements of the international application:\***

the international application as originally filed

the description:

pages 1-4, 7-12, 14-33, 35-39, and 41-58, as originally filed

pages 5, 5a, 6, 6a, 13, 34, and 40, filed with the demand

pages NONE, filed with the letter of \_\_\_\_\_

the claims:

pages 59-60, as originally filed

pages NONE, as amended (together with any statement) under Article 19

pages NONE, filed with the demand

pages NONE, filed with the letter of \_\_\_\_\_

the drawings:

pages 1-17, as originally filed

pages NONE, filed with the demand

pages NONE, filed with the letter of \_\_\_\_\_

the sequence listing part of the description:

pages 1-39, as originally filed

pages NONE, filed with the demand

pages NONE, filed with the letter of \_\_\_\_\_

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

the language of publication of the international application (under Rule 48.3(b)).

the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:**

contained in the international application in printed form.

filed together with the international application in computer readable form.

furnished subsequently to this Authority in written form.

furnished subsequently to this Authority in computer readable form.

The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

**4.  The amendments have resulted in the cancellation of:**

the description, pages NONE \_\_\_\_\_

the claims, Nos. NONE \_\_\_\_\_

the drawings, sheets/fig NONE \_\_\_\_\_

**5.  This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed."

## WRITTEN OPINION

International application No.  
PCT/US03/23155**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

Novelty (N)	Claims <u>NONE</u>	YES
	Claims <u>1-8</u>	NO
Inventive Step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-8</u>	NO
Industrial Applicability (IA)	Claims <u>1-8</u>	YES
	Claims <u>NONE</u>	NO

**2. CITATIONS AND EXPLANATIONS**

Claims 1-8 lack novelty under PCT Article 33(2) as being anticipated by Taylor et al. (US 6,399,337 B1, 6-4-2002). Claims 1-8 are directed to a method of producing fucosylated glycoprotein using a fucosyltransferase polypeptide having an amino acid sequence SEQ ID NO:2, 4, 6, or 8 or a polypeptide that is at least 90% identical to SEQ ID NO:2, 4, 6, or 8. Taylor et al. not only disclose a fucosyltransferase polypeptide that has an amino acid sequence which is 100% identical to SEQ ID NO :2 or 6 but also a method of fucosylating oligosaccharides using said polypeptide. Therefore, the reference of Taylor et al. anticipates claims 1-8 as written. In the alternative, the above reference renders claims 1-8 *prima facie* obvious to one of ordinary skill in the art because, it would be well within the knowledge of those artisans making fucosylated glycoproteins to use the same enzyme to make glycoproteins in order to fucosylate carbohydrate groups on any given glycoprotein using the very same enzyme. Therefore, the above reference renders claims 1-8 *prima facie* obvious to those skilled in the art.

Claims 1-8 lack an inventive step under PCT Article 33(3) as being obvious over Taylor et al. The above reference renders claims 1-8 *prima facie* obvious to one of ordinary skill in the art because, it would be well within the knowledge of those artisans making fucosylated glycoproteins to use the enzyme used for fucosylation of oligosaccharides to make fucosylated glycoproteins in order to fucosylate carbohydrate groups on any given glycoprotein. Therefore, the above reference renders claims 1-8 *prima facie* obvious to those skilled in the art.

Claims 1-8 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

---

----- NEW CITATIONS -----

WRITTEN OPINION

International application No.  
PCT/US03/23155

**Supplemental Box**  
(To be used when the space in any of the preceding boxes is not sufficient)

**TIME LIMIT:**

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

<b>TO:</b> BETH L. KELLY TOWNSEND AND TOWNSEND AND CREW LLP TWO EMBARCADERO CENTER 8TH FLOOR SAN FRANCISCO, CALIFORNIA 94111	<b>UNITED STATE</b>	<b>DESIGNATED/ELECTED OFFICE (DO/EO/US)</b>
<b>NOTIFICATION OF STATUS OF REQUIREMENTS UNDER 35 U.S.C. 371</b>		
<b>DATE OF MAILING (day/month/year)</b>		29 Aug 2003
<b>FILE REFERENCE</b> 19957-159-3P		
<b>IDENTIFICATION OF INTERNATIONAL APPLICATION</b>		
<b>International application No.</b>	<b>International filing date (day/month/year)</b>	<b>Priority Date Claimed</b>
PCT/US03/23057	23 Jul 2003	23 Jul 2002
<b>Applicant for DO/EO/US</b>  JOHNSON, KARL, F.		
<b>NOTIFICATION</b>		
<p>The applicant is hereby advised that the U.S. Patent and Trademark Office in its capacity as <input checked="" type="checkbox"/> Designated Office <input type="checkbox"/> Elected Office has received following items as of the date of mailing indicated above.</p>		
1. <input type="checkbox"/> U.S. Nation fee [35 U.S.C 371 (c) (1)] 2. <input type="checkbox"/> Oath of declaration [35 U.S.C 371 (c) (4)] 3. <input checked="" type="checkbox"/> Copy of International application as [35 U.S.C 371 (c) (2)] 4. <input type="checkbox"/> Translation of Application [35 U.S.C 371 (c) (2)] 5. <input type="checkbox"/> Amendments under PCT Article 19 [35 U.S.C 371 (c) (3)] 6. <input type="checkbox"/> Translation of PCT Article 19 Amendments [35 U.S.C 371 (c) (3)] 7. <input type="checkbox"/> Search Report or Declaration under PCT Article 17(2) [35 U.S.C 371 (a)] 8. <input type="checkbox"/> International Preliminary Examination Report and its Annexes, if any, under PCT Article 36(3)(b) <input type="checkbox"/> [35 U.S.C 371 (a)] 9. <input type="checkbox"/> Translation of Annexes to the International Preliminary Examination Report under PCT Article 36(3)(b) [35 U.S.C 371 (c) (5)] 10. <input type="checkbox"/> Other items received: <input type="checkbox"/> Assignment Document <input type="checkbox"/> Prior Art Statement <input type="checkbox"/> Preliminary Amendment		
A. <input type="checkbox"/> Requirements for U.S. National processing have been met. Processing will commence <input type="checkbox"/> at the expiration of the applicable time limit under either <input type="checkbox"/> PCT Article 22 [35 U.S.C 371 (b)] or <input type="checkbox"/> PCT Article 39 [35 U.S.C 371 (b)] <input type="checkbox"/> on the date indicated below under the provisions of 35 U.S.C 371 (f)		
<b>U.S. NATIONAL SERIAL#</b>	<b>DATE UNDER 35 U.S.C. 102(e)</b>	<b>DATE OF COMMENCEMENT OF NATIONAL PROCESSING</b>
<i>All correspondence submitted after the date of commencement of U.S. National processing indicated above should refer to the U.S. National Serial Number and the appropriate U.S. National processing organization of Officer.</i>		
B. <input type="checkbox"/> As the above identified application has been accepted for U.S. National processing under the provision of 35 U.S.C.371 (f) before expiration of the applicable time limit under <input type="checkbox"/> PCT Article 22 <input type="checkbox"/> PCT Article 39, applicant is reminded that <input type="checkbox"/> Amendments under PCT Article 19 and/or <input type="checkbox"/> the International Preliminary Examination Report and its Annexes, if any, under PCT Article 36(3)(a), and (b) and any translation thereof, if applicable, must be submitted to the Patent and Trademark Office as soon as they are available.		

TRANSMITTAL LETTER OF THE  
UNITED STATES RECEIVING OFFICE

DATE	September 2003
INTERNATIONAL APPL. NO.	PCT/US03/23057
ATTY DOCKET NO.	19957-159-3P

## I. Certification under 37 CFR 1.10 (if applicable)

EV 332 015 282 US	17 September 2003
Express Mail mailing number	Date of Deposit

II.  New International Application

Title	Earliest priority date (Day/Month/Year)
-------	--

**SCREENING DISCLOSURE INFORMATION:** In order to assist in screening the accompanying international application for purposes of determining whether a license for foreign transmittal should and could be granted and for other purposes, the following information is supplied. (Note: check as many boxes as apply):

- A.  The invention disclosed was not made in the United States.  
 B.  There is no prior U.S. application relating to this invention.  
 C.  The following prior U.S. application(s) contain subject matter which is related to the invention disclosed in the attached international application. (NOTE: *priority to these applications may or may not be claimed on form PCT/RO/101 (Request) and this listing does not constitute a claims for priority*).

application no.	filed on
application no.	filed on

- D.  The present international application  contains additional subject matter not found in the prior U.S. application(s) identified in paragraph C above. The additional subject matter is found on pages: \_\_\_\_\_ and  DOES NOT ALTER  MIGHT BE CONSIDERED TO ALTER the general nature of the invention in a manner which would require the U.S. application to have been made available for inspection by the appropriate defense agencies under 35 USC 181 and 37 CFR 5.1. See 37 CFR 5.15.

III.  A Response to an Invitation from the RO/US. The following document(s) is (are) enclosed:

- A.  A Request for an Extension of Time to File a Response.  
 B.  A Power of Attorney (General or Regular)  
 C.  Replacement pages:

pages	6/9-8/9	of the request (PCT/RO/101)	pages		of the figures
pages		of the description	pages		of the abstract
pages		of the claims			

- D.  Submission of Priority Documents

Priority document	..	Priority document	
-------------------	----	-------------------	--

- E.  Fees as specified on attached Fee Calculation sheet form PCT/RO/101 annex

IV.  A Request for rectification under PCT 91       A Petition       A Sequence Listing DisketteV.  Other (please specify):  Postcard     Letter to Officer Hostad

The Commissioner is hereby authorized to charge any additional fees associated with this paper or during the pendency of this application, or credit any overpayment, to Deposit Account No. 20-1430.

The person signing this form is the	<input type="checkbox"/> Applicant	Beth L. Kelly
	<input checked="" type="checkbox"/> Attorney/Agent (Reg. No.) 51,868	Typed name of signer
	<input type="checkbox"/> Common Representative	Signature

10/521138

TELETYPE RECEIVED 10/2 JAN 2003

San Francisco

TOWNSEND

and

TOWNSEND

and

CREW

LLP

Denver, Colorado  
Tel 303 571-4000

Palo Alto, California  
Tel 650 326-2400

Seattle, Washington  
Tel 206 467-9600

Two Embarcadero Center  
Eighth Floor  
San Francisco  
California 94111-3834  
Tel 415 576-0200  
Fax 415 576-0300

17 September 2003

**VIA EXPRESS MAIL, WITH RETURN POSTCARD ENCLOSED**

Officer Sigfried Hostad  
PCT International Application Processing Div.  
USPTO International Division  
Assistant Commissioner for Patents  
Mail Stop PCT  
PO Box 1450  
Alexandria, VA 22313-1450

Re: International Application No. PCT/US03/23057  
Title: H. PYLORI FUCOSYLTRANSFERASES  
Applicant: NEOSE TECHNOLOGIES, INC. *et al.*  
International Filing Date: 23 July 2003  
Express Mail Label No.: EV 332 015 282 US  
Date of Mailing: 17 September 2003  
Our File No.: 19957-159-3P

Dear Officer Hostad:

In response to your Invitation to Correct Defects dated 29 August 2003, enclosed please find replacement Declaration of Inventorship pages (6/9-7/9 of the Request) and a replacement Signature page (8/9 of the Request) for the above referenced application.

Thank you for your attention to this matter.

Respectfully submitted,

TOWNSEND and TOWNSEND and CREW LLP



Beth L. Kelly  
Reg. No. 51,868

BLK/nan

Enclosures: Replacement Declaration of Inventorship pages (6/9-7/9 of the Request)  
Replacement Signature page (8/9 of the Request)  
Transmittal Letter  
Postcard

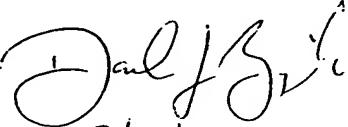
SF 60040839 v1

Original (for SUBMISSION) - printed on 23.07.2003 04:28:10 PM

<p>I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application.</p> <p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.</p>	
VIII-4-1 -1-1	Name:
VIII-4-1 -1-2	Residence: (city and either US State, if applicable, or country)
VIII-4-1 -1-3	Mailing address:
VIII-4-1 -1-4	Citizenship:
VIII-4-1 -1-5	Inventor's Signature: (if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of the inventor, not that of the agent)
VIII-4-1 -1-6	Date: (of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)

**PCT REQUEST**

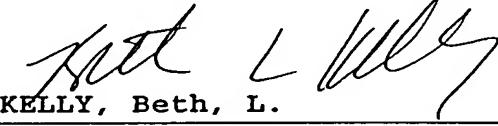
Original (for SUBMISSION) - printed on 23.07.2003 04:28:10 PM

VIII-4-1 -2-1	Name:	BEZILA, Daniel, James
VIII-4-1 -2-2	Residence: (city and either US State, if applicable, or country)	Philadelphia, Pennsylvania
VIII-4-1 -2-3	Mailing address:	715 Red Lion Road, 2nd Floor
VIII-4-1 -2-4	Citizenship:	US
VIII-4-1 -2-5	Inventor's Signature: (if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of the inventor, not that of the agent)	 7/31/03
VIII-4-1 -2-6	Date: (of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)	

**PCT REQUEST**

19957-159-3P

Original (for SUBMISSION) - printed on 23.07.2003 04:28:10 PM

<b>IX</b>	<b>Check list</b>	<b>number of sheets</b>	<b>electronic file(s) attached</b>
IX-1	Request (including declaration sheets)	9	-
IX-2	Description	46	-
IX-3	Claims	4	-
IX-4	Abstract	1	EZABST00.TXT
IX-5	Drawings	21	-
IX-7	<b>TOTAL</b>	<b>81</b>	
	<b>Accompanying items</b>	<b>paper document(s) attached</b>	<b>electronic file(s) attached</b>
IX-8	Fee calculation sheet	✓	-
IX-11	Copy of general power of attorney	reference no. 19957	-
IX-17	PCT-EASY diskette	-	Diskette
IX-18	Other (specified):	Transmittal Sheet	-
IX-18	Other (specified):	Postcard	-
IX-19	Figure of the drawings which should accompany the abstract	15	
IX-20	Language of filing of the international application	English	
X-1	Signature of applicant, agent or common representative		
X-1-1	Name (LAST, First)	KELLY, Beth, L.	
X-2	Signature of applicant, agent or common representative		
X-2-1	Name (LAST, First)	JOHNSON, Karl, F.	
X-3	Signature of applicant, agent or common representative		
X-3-1	Name (LAST, First)	BEZILA, Daniel, James	

**FOR RECEIVING OFFICE USE ONLY**

10-1	Date of actual receipt of the purported International application	
10-2	Drawings: ..	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/US
10-6	Transmittal of search copy delayed until search fee is paid	

## PATENT COOPERATION TREATY

**From the RECEIVING OFFICE**

To:

BETH L. KELLY  
TOWNSEND AND TOWNSEND AND CREW LLP  
TWO EMBARCADERO CENTER  
8TH FLOOR  
SAN FRANCISCO, CALIFORNIA 94111

PCT

## **INVITATION TO CORRECT DEFECTS IN THE INTERNATIONAL APPLICATION**

(PCT Articles 3(4)(i) and 14(1) and Rule 26)

019957-015980 PCT		Date of mailing (day/month/year)	29 Aug 2003
Applicant's or agent's file reference  19957-159-3P	REPLY DUE 9-29-03 within 1 months/days from the above date of mailing		
International application No.  PCT/US03/23057	International filing date (day/month/year)		
Applicant  NEOSE TECHNOLOGIES, INC.	23 Jul 2003		

1.  The applicant is hereby invited, within the time limit indicated above, to correct, in the international application as filed, the defects specified on the attached:

Annex A

Annex B1 (*text matter of the international application as filed*)

Annex C1 (*drawings of the international application as filed*)

2.  The applicant is hereby invited, within the time limit indicated above, to correct, in the translation of the international application furnished under Rule 12.3 or 12.4, the defects specified on the attached:

Annex A

Annex B2 (*text matter of the translation of the international application*)

Annex C2 (*drawings of the translation of the international application*)

**Additional observations (if necessary):**

#### **HOW TO CORRECT THE DEFECTS?**

**Correction must be submitted by filing a replacement sheet embodying the correction and a letter accompanying the replacement sheet, which shall draw attention to the difference between the replaced sheet and the replacement sheet. A correction may be stated in a letter only if it is of such a nature that it can be transferred from the letter to the record copy without adversely affecting the clarity and direct reproducibility of the sheet onto which the correction is to be transferred (Rule 26.4).**

## **ATTENTION**

**Failure to correct the defects will result in the international application being considered withdrawn by this receiving Office (see Rule 26.5 for further details).**

A copy of this invitation and any attachments has been sent to the International Bureau

 and the International Searching Authority

Name and mailing address of the receiving Office <b>Mail Stop PCT, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450</b> Facsimile No. 703-305-3230	Authorized officer <b>Sigfried Hostad</b> Telephone No. 703-305-3680
---	--

## ANNEX A TO FORM PCT/RO/106

International application No.

PCT/US03/23057

The receiving Office has found the following defects in the international application as filed:

1. As to signature\* of the international application (Rules 4.15 and 90.4), the request:
- a.  is not signed
  - b.  is not signed by all the applicants
  - c.  is not accompanied by the statement referred to in the check list in Box No. VIII of the request explaining the lack of the signature of an applicant for the designation of the United States of America
  - d.  is signed by what appears to be an agent/common representative but:
    - the international application is not accompanied by a power of attorney appointing him
    - the power of attorney accompanying the international application was not signed by all the applicants
  - e.  other (*specify*):

\* All applicants must sign, including inventors if they are also applicants (e.g. where the United States of America is designated).

2. As to indications concerning the applicant, the request (Rules 4.4 and 4.5):

- a.  does not properly indicate the applicant's name (*specify*):
- b.  does not indicate the applicant's address
- c.  does not properly indicate the applicant's address (*specify*):
  
- d.  does not indicate the applicant's nationality
- e.  does not indicate the applicant's residence
- f.  other (*specify*):

3. As to the language of certain elements of the international application, other than the description and claims (Rules 12.1(c) and 26.3ter(a) and (c)):

- a.  the request is not in a language of publication accepted by this receiving Office; (the) language(s) accepted by this receiving Office is/are:
- b.  the text matter of the drawings is not in the language in which the international application is to be published, which is:
- c.  the abstract is not in the language in which the international application is to be published, which is:

4. The title of the invention:

- a.  is not indicated in Box No. I of the request (Rule 4.1(a))
- b.  is not indicated at the top of the first sheet of the description (Rule 5.1(a))
- c.  as appearing in Box No. I of the request is not identical with the title heading the description (Rule 5.1(a))

5. As to the abstract (Rule 8):

- the international application does not contain an abstract

*NAN* F. TENT COOPERATION TRF BY

From the INTERNATIONAL SEARCHING AUTHORITY

To:

BETH L. KELLY  
TOWNSEND AND TOWNSEND AND CREW LLP  
TWO EMBARCADERO CENTER  
8TH FLOOR  
SAN FRANCISCO, CALIFORNIA 94111

PCT

NOTIFICATION OF RECEIPT  
OF SEARCH COPY

(PCT Rule 25.1)

014887-015930PU

Date of mailing (day/month/year)		29 Aug 2003
Applicant's or agent's file reference 19957-159-3P		
International application No. PCT/US03/23057	International filing date (day/month/year) 23 Jul 2003	Priority date (day/month/year) 23 Jul 2002
Applicant NEOSE TECHNOLOGIES, INC.		

1. **Where the International Searching Authority and the receiving Office are not the same Office:**

The applicant is hereby notified that the search copy of the international application was received by this International Searching Authority on the date indicated below.

**Where the International Searching Authority and the receiving Office are the same Office:**

The applicant is hereby notified that the search copy of the international application was received on the date indicated below.

29 Aug 2003

*(date of receipt).*

2.  The search copy was accompanied by a nucleotide and/or amino acid sequence listing in computer readable form.

3. **Time limit for establishment of international search report**

The applicant is informed that the time limit for establishing the international search report is 3 months from the date of receipt indicated above or 9 months from the priority date, whichever time limit expires later.

4. A copy of this notification has been sent to the International Bureau and, where the first sentence of paragraph 1 applies, to the receiving Office.

Name and mailing address of the ISA/ Mail Stop PCT, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 703-305-3230	Authorized officer Sigfried Hostad Telephone No. 703-305-3680
---	---

*CW*

10/521138

DT12 Rec'd PCT/PTO 12 JAN 2005  
11/03/2003**TRANSMITTAL LETTER THE  
UNITED STATES RECEIVING OFFICE**

DATE	November 2003
INTERNATIONAL APPL. NO.	PCT/US03/23057
ATTY DOCKET NO.	19957-159-3P

**I. Certification under 37 CFR 1.10 (if applicable)**

EV 332 022 575 US

21 November 2003

Express Mail mailing number

Date of Deposit

**II.  New International Application**

Title		Earliest priority date (Day/Month/Year)

**SCREENING DISCLOSURE INFORMATION:** In order to assist in screening the accompanying international application for purposes of determining whether a license for foreign transmittal should and could be granted and for other purposes, the following information is supplied. (Note: check as many boxes as apply):

- A.  The invention disclosed was not made in the United States.
- B.  There is no prior U.S. application relating to this invention.
- C.  The following prior U.S. application(s) contain subject matter which is related to the invention disclosed in the attached international application. (NOTE: *priority to these applications may or may not be claimed on form PCT/RO/101 (Request) and this listing does not constitute a claims for priority.*)

application no.		filed on	
application no.		filed on	

- D.  The present international application  contains additional subject matter not found in the prior U.S. application(s) identified in paragraph C above. The additional subject matter is found on pages: \_\_\_\_\_ and  DOES NOT ALTER  MIGHT BE CONSIDERED TO ALTER the general nature of the invention in a manner which would require the U.S. application to have been made available for inspection by the appropriate defense agencies under 35 USC 181 and 37 CFR 5.1. See 37 CFR 5.15.

**III.  A Response to an Invitation from the RO/US. The following document(s) is (are) enclosed:**

- A.  A Request for an Extension of Time to File a Response.
- B.  A Power of Attorney (General or Regular)
- C.  Replacement pages:

pages	of the request (PCT/RO/101)	pages	of the figures
pages	of the description	pages	of the abstract
pages	of the claims		

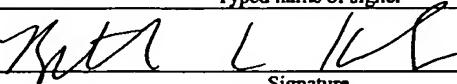
**D.  Submission of Priority Documents**

Priority document		Priority document	
-------------------	--	-------------------	--

**E.  Fees as specified on attached Fee Calculation sheet form PCT/RO/101 annex****IV.  A Request for rectification under PCT 91       A Petition       A Sequence Listing Diskette****V.  Other (please specify):     Postcard     Letter to Officer Hostad**

The Commissioner is hereby authorized to charge any additional fees associated with this paper or during the pendency of this application, or credit any overpayment, to Deposit Account No. 20-1430.

The person  
signing  
this form is  
the

<input type="checkbox"/> Applicant	Beth L. Kelly
<input checked="" type="checkbox"/> Attorney/Agent (Reg. No.) 51,868	Typed name of signer
<input type="checkbox"/> Common Representative	 Signature

10/5215  
OCT 21 1966 12 00 1966

**TOWNSEND**  
*and*  
**TOWNSEND**  
*and*  
**CREW**

11 P

Denver, Colorado  
Tel 303 571-4000

San Francisco

Palo Alto, California  
Tel 650 326-2400

Seattle, Washington  
Tel 206 467-9600

Two Embarcadero Center  
Eighth Floor  
San Francisco  
California 94111-3834  
Tel 415 576-0200  
Fax 415 576-0300

21 November 2003

**VIA EXPRESS MAIL, WITH RETURN POSTCARD ENCLOSED**

Officer Sigfried Hostad  
PCT International Application Processing Div.  
USPTO International Division  
Assistant Commissioner for Patents  
Mail Stop PCT  
PO Box 1450  
Alexandria, VA 22313-1450

Re: International Application No. PCT/US03/23057  
Title: H. PYLORI FUCOSYLTRANSFERASES  
Applicant: NEOSE TECHNOLOGIES, INC. *et al.*  
International Filing Date: 23 July 2003  
Express Mail Label No.: EV 332 022 575 US  
Date of Mailing: 21 November 2003  
Our File No.: 19957-159-3P

Dear Officer Hostad:

Pursuant to Rule 92bis, Applicants' respectfully request the addition of a co-applicant, Governors of the University of Alberta, and inventors David Rasko, Joanne Simala-Grant and Diane Taylor to the above-referenced patent application. In this regard, enclosed please find four (4) executed Power of Attorney documents. Please add the following to the PCT application:

**Co-Applicant:**

**GOVERNORS OF THE UNIVERSITY OF ALBERTA**  
222 Campus Tower  
8625 112th Street  
Edmonton, Alberta  
Canada T6G 2E1

**Applicants/Inventors:**

**David RASKO (Applicant/Inventor #1)**  
2500 Clarendon Boulevard, Apt. 627  
Arlington, VA 22201  
United States of America

**Joanne SIMALA-GRANT (Applicant/Inventor #2)**  
10115 87 Avenue  
Edmonton, Alberta  
Canada T6E 2P3

**Diane TAYLOR (Applicant/Inventor #3)**  
3911 118 Street  
Edmonton, Alberta  
Canada T6J 1X2

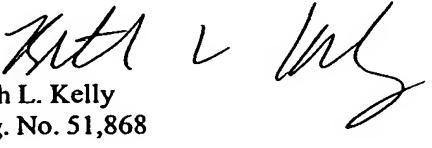
PCT International Application Processing Div.  
21 November 2003  
Page 2

Please note, the above-referenced applicants/inventors should be listed before the applicants/inventors that were originally named in the PCT application. Therefore, Karl F. Johnson should be listed as applicant/inventor #4 and Daniel James Bezila as applicant/inventor #5. Applicants respectfully await the Notifications of the Recording of these Changes, Form PCT/IB/306.

Thank you for your attention to this matter.

Respectfully submitted,

TOWNSEND and TOWNSEND and CREW LLP

  
Beth L. Kelly

Reg. No. 51,868

BLK/nan  
Enclosures:      Four (4) executed Power of Attorney documents  
                      Transmittal Letter  
                      Postcard

60086808 v1

# PCT

## POWER OF ATTORNEY

(for an international application filed under the Patent Cooperation Treaty)

(PCT Rule 90.4)

The undersigned applicant(s) (names should be indicated as they appear in the request):

### GOVERNORS OF THE UNIVERSITY OF ALBERTA

222 Campus Tower  
8625 112th Street  
Edmonton, Alberta  
Canada T6G 2E1

hereby appoints (appoint) the following person as:  agent  common representative

#### Name and address

(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

KELLY, Beth, L.; BASTIAN, Kevin, L.; PARENT, Annette, S.; SMITH, William, M.;  
WEBER, Kenneth A.; SNYDER, Josephs, R.; LIEBESCHUETZ, Joseph;  
KEZER, William, B.; GARRETT-WACKOWSKI, Eugenia; MANN, Jeffry, S.

### TOWNSEND AND TOWNSEND AND CREW LLP

Two Embarcadero Center, 8th Floor  
San Francisco, California 94111  
United States of America

to represent the undersigned before

all the competent International Authorities

the International Searching Authority only

the International Preliminary Examining Authority only

in connection with the international application identified below:

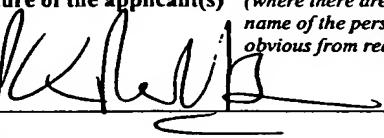
Title of the invention: *H. pylori* FUCOSYLTRANSFERASES

Applicant's or agent's file reference: 19957-159-3P

International application number (if already available): PCT/US03/23057

filed with the following Office United States as receiving Office and to make or receive payments on behalf of the undersigned.

Signature of the applicant(s) (where there are several applicants, each of them must sign; next to each signature, indicate the name of the person signing and the capacity in which the person signs, if such capacity is not obvious from reading the request or this power):

By 

Name:

Title:

Date: NOVEMBER 18, 2003

Dr. Peter Robertson  
Associate Vice-President  
(Research/Industry Relations) and  
Director, Research Services Office  
The University of Alberta

# PCT

## POWER OF ATTORNEY (for an international application filed under the Patent Cooperation Treaty)

(PCT Rule 90.4)

The undersigned applicant(s) (*names should be indicated as they appear in the request*):

DAVID RASKO  
2500 Clarendon Boulevard, Apt. 627  
Arlington, VA 22201  
United States Of America

hereby appoints (appoint) the following person as:  agent  common representative

**Name and address**

*(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

KELLY, Beth, L.; BASTIAN, Kevin, L.; PARENT, Annette, S.; SMITH, William, M.;  
WEBER, Kenneth A.; SNYDER, Josephs, R.; LIEBESCHUETZ, Joseph;  
KEZER, William, B.; GARRETT-WACKOWSKI, Eugenia; MANN, Jeffry, S.

TOWNSEND AND TOWNSEND AND CREW LLP  
Two Embarcadero Center, 8th Floor  
San Francisco, California 94111  
United States of America

to represent the undersigned before  all the competent International Authorities

the International Searching Authority only

the International Preliminary Examining Authority only

in connection with the international application identified below:

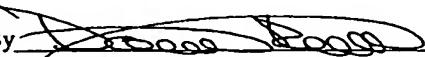
**Title of the invention:** *H. pylori FUCOSYLTRANSFERASES*

**Applicant's or agent's file reference:** 19957-159-3P

**International application number (if already available):** PCT/US03/23057

filed with the following Office United States as receiving Office and to make or receive payments on behalf of the undersigned.

**Signature of the applicant(s)** (*where there are several applicants, each of them must sign; next to each signature, indicate the name of the person signing and the capacity in which the person signs, if such capacity is not obvious from reading the request or this power*):

By 

Name: **David Rasko**

Title: **Inventor**

Date: Nov 4 (2003)

# PCT

## POWER OF ATTORNEY

(for an international application filed under the Patent Cooperation Treaty)

(PCT Rule 90.4)

The undersigned applicant(s) (names should be indicated as they appear in the request):

JOANNE SIMALA-GRANT  
10115 87 Avenue  
Edmonton, Alberta  
Canada T6E 2P3

hereby appoints (appoint) the following person as:  agent  common representative

**Name and address**

(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

KELLY, Beth, L.; BASTIAN, Kevin, L.; PARENT, Annette, S.; SMITH, William, M.;  
WEBER, Kenneth A.; SNYDER, Josephs, R.; LIEBESCHUETZ, Joseph;  
KEZER, William, B.; GARRETT-WACKOWSKI, Eugenia; MANN, Jeffry, S.

TOWNSEND AND TOWNSEND AND CREW LLP  
Two Embarcadero Center, 8th Floor  
San Francisco, California 94111  
United States of America

to represent the undersigned before

all the competent International Authorities

the International Searching Authority only

the International Preliminary Examining Authority only

in connection with the international application identified below:

**Title of the invention:** *H. pylori* FUCOSYLTRANSFERASES

**Applicant's or agent's file reference:** 19957-159-3P

**International application number (if already available):** PCT/US03/23057

filed with the following Office United States as receiving Office and to make or receive payments on behalf of the undersigned.

**Signature of the applicant(s)** (where there are several applicants, each of them must sign; next to each signature, indicate the name of the person signing and the capacity in which the person signs, if such capacity is not obvious from reading the request or this power):

By Joanne Simala.

Name: Joanne Simala-Grant

Title: Inventor

Date: Nov 14/03

# PCT

## POWER OF ATTORNEY

(for an international application filed under the Patent Cooperation Treaty)

(PCT Rule 90.4)

The undersigned applicant(s) (names should be indicated as they appear in the request):

DIANE TAYLOR  
3911 118 Street  
Edmonton, Alberta  
Canada T6J 1X2

hereby appoints (appoint) the following person as:  agent  common representative

Name and address

(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

KELLY, Beth, L.; BASTIAN, Kevin, L.; PARENT, Annette, S.; SMITH, William, M.;  
WEBER, Kenneth A.; SNYDER, Josephs, R.; LIEBESCHUETZ, Joseph;  
KEZER, William, B.; GARRETT-WACKOWSKI, Eugenia; MANN, Jeffry, S.

TOWNSEND AND TOWNSEND AND CREW LLP  
Two Embarcadero Center, 8th Floor  
San Francisco, California 94111  
United States of America

to represent the undersigned before

all the competent International Authorities

the International Searching Authority only

the International Preliminary Examining Authority only

in connection with the international application identified below:

Title of the invention: *H. pylori* FUCOSYLTRANSFERASES

Applicant's or agent's file reference: 19957-159-3P

International application number (if already available): PCT/US03/23057

filed with the following Office United States as receiving Office and to make or receive payments on behalf of the undersigned.

Signature of the applicant(s) (where there are several applicants, each of them must sign; next to each signature, indicate the name of the person signing and the capacity in which the person signs, if such capacity is not obvious from reading the request or this power):

By Diane Taylor

Name: Diane Taylor

Title: Inventor

Date: 14 Nov. 2003

NAN

## PATENT COOPERATION TREATY

From the RECEIVING OFFICE

19 Aug 2003 12 JAN 2005

PCT

NOTIFICATION OF THE INTERNATIONAL  
APPLICATION NUMBER AND OF THE  
INTERNATIONAL FILING DATE

(PCT Rule 20.5(c))

019957-015930PC

Applicant's or agent's file reference 19957-159-3P		Date of mailing (day/month/year) 29 Aug 2003	
International application No. PCT/US03/23057		International filing date (day/month/year) 23 Jul 2003	Priority date (day/month/year) 23 Jul 2002
Applicant NEOSE TECHNOLOGIES, INC.			
Title of the invention H. PYLORI FUCOSYLTRANSFERASES			

1. The applicant is hereby notified that the international application has been accorded the international application number and the international filing date indicated above.

2. The applicant is further notified that the record copy of the international application:

- was transmitted to the International Bureau on 29 Aug 2003
- has not yet been transmitted to the International Bureau for the reason indicated below and a copy of this notification has been sent to the International Bureau\*:
- because the necessary national security clearance has not yet been obtained.
- because (reason to be specified):

\* The International Bureau monitors the transmittal of the record copy by the receiving Office and will notify the applicant (with Form PCT/IB/301) of its receipt. Should the record copy not have been received by the expiration of 14 months from the priority date, the International Bureau will notify the applicant (Rule 22.1(c)).

## 3. FOREIGN TRANSMITTAL LICENSE INFORMATION

Completed by: SH

- Additional license for foreign transmittal not required. This subject matter is covered by a license already granted or the equivalent U.S. national application. Refer to that license for information concerning its scope.
- License for foreign transmittal not required. 37 CFR 5.11(e)(1) or 37 CFR 5.11(e)(2). However, a license may be required for additional subject matter. See 37 CFR 5.15(b).
- Foreign transmittal license granted. 35 U.S.C. 184; 37 CFR 5.11 on 26 Aug 2003  
(date)
- 37 CFR 5.15(a)       37 CFR 5.15(b)

Name and mailing address of the receiving Office Mail Stop PCT, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 703-305-3230	Authorized officer Sigfried Hostad Telephone No. 703-305-3680
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Form PCT/RO/105 (July 1992)

Julia Recet rec'd 9-8-03  
DOCKETED BY av  
RJD Cappin Inv. 10-8-03

JAN 2003

**PATENT COOPERATION TREATY**

NAN

**PCT**

**NOTIFICATION RELATING TO  
DECLARATION MADE UNDER PCT RULE 4.17**

(PCT Rules 26ter.2(b), 47.1(a-ter) and 48.2(a)(x)  
and Administrative Instructions, Section 419)

OK957-015930pc

From the INTERNATIONAL BUREAU

To:

KELLY, Beth, L.  
Townsend and Townsend and Crew LLP  
Two Embarcadero Center  
8th Floor  
San Francisco, CA 94111  
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 20 October 2003 (20.10.03)	
Applicant's or agent's file reference 19957-159-3P	<b>IMPORTANT NOTIFICATION</b>
International application No. PCT/US03/23057 ✓	International filing date (day/month/year) 23 July 2003 (23.07.03) ✓
Applicant NEOSE TECHNOLOGIES, INC.	

1. The applicant is hereby notified of the following regarding the declaration indicated below in respect of (name(s) indicated in the declaration) JOHNSON, KARL, F ; BEZILA, DANIEL, JAMES. :
  - (i)  declaration as to the identity of the inventor (Rules 4.17(i) and 51bis.1(a)(i) and Section 211)
  - (ii)  declaration as to the applicant's entitlement, as at the international filing date, to apply for or be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii) and Section 212)
  - (iii)  declaration as to the applicant's entitlement, as at the international filing date, to claim priority of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii) and Section 213)
  - (iv)  declaration of inventorship (for the purposes of the designation of the United States of America) (Rules 4.17(iv) and 51bis.1(a)(iv) and Section 214)
  - (v)  declaration as to non-prejudicial disclosures or exceptions to lack of novelty (Rules 4.17(v) and 51bis.1(a)(v) and Section 215)
2.  **Addition or correction of the declaration within the time limit under Rule 26ter.1.**

The added or corrected declaration was received on (date), 14 October 2003 (14.10.03), which was received within the time limit under Rule 26ter.1.

Any declaration referred to under items 1(i) to (iv) whether or not the declaration complies with Rule 4.17, will be communicated to the designated Offices concerned pursuant to Rule 47.1(a-ter) and any declaration referred to under item 1(v) will be published as part of the pamphlet pursuant to Rule 48.2(a)(x).
3.  **Failure to add or correct the declaration within the time limit under Rule 26ter.1.**

The declaration, was received on (date) \_\_\_\_\_, which was after the expiration of the time limit under Rule 26ter.1; therefore, any such declaration referred to under items 1(i) to (iv) will not be communicated to the designated Offices concerned, any such declaration referred to under item 1(v) will not be published as part of the pamphlet, and any signed declaration referred to under item 1(iv) is attached. Such declaration should be submitted by the applicant directly to the designated Offices concerned.
4. The applicant's attention is drawn to Rule 51bis.2 which provides that the designated Office shall not, unless it may reasonably doubt the veracity of the declaration concerned, require any document or evidence relating to the subject matter of any declaration complying with Rule 4.17(i) to (iv) which is contained in the request or submitted to the International Bureau or directly to the designated Office. Note, however, that Rule 51bis.2 may not apply in respect of certain States. For further information, see Notes to the request form, Box No. VIII.
5. A copy of this notification is being sent to the receiving Office and the International Searching Authority.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 338.87.40	Authorized officer  Tewfik BENYAHIA  Telephone No. (41-22) 338.84.59
--	--

11-23-03

NAN

## PATENT COOPERATION TREATY

PCT

**NOTIFICATION OF RECEIPT OF  
RECORD COPY**  
(PCT Rule 24.2(a))

From the INTERNATIONAL BUREAU

To:

KELLY, Beth, L.  
Townsend and Townsend and Crew LLP  
Two Embarcadero Center  
8th Floor  
San Francisco, CA 94111  
United States of America

Date of mailing (day/month/year) 19 September 2003 (19.09.03)	<b>IMPORTANT NOTIFICATION</b>
Applicant's or agent's file reference 19957-159-3P <i>019957-615930PC</i>	International application No. PCT/US03/23057

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

NEOSE TECHNOLOGIES, INC. (for all designated States except US)  
JOHNSON, Karl, F. et al (for US)

International filing date : 23 July 2003 (23.07.03) ✓  
 Priority date(s) claimed : 23 July 2002 (23.07.02) ✓  
                               : 08 November 2002 (08.11.02) ✓  
 Date of receipt of the record copy by the International Bureau : 05 September 2003 (05.09.03)  
 List of designated Offices :

AP : GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW  
 EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 EP : AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR  
 OA : BF, BJ, CF, CG, CI, CM, GA, GN, GO, GW, ML, MR, NE, SN, TD, TG  
 National : AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

*10/23/03*  
*Carine Sevillano*  
**DOCKETED BY** *Carine*

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 338.87.40	Authorized officer:  Carine SEVILLANO (Fax 022 338 87 40)  Telephone No. (41-22) 338 9254
--	---

## Continuation of Form PCT/IB/301

## NOTIFICATION OF RECEIPT OF RECORD COPY

Date of mailing (day/month/year) 19 September 2003 (19.09.03)	<b>IMPORTANT NOTIFICATION</b>
Applicant's or agent's file reference 19957-159-3P	International application No. PCT/US03/23057

**ATTENTION**

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

- time limits for entry into the national phase - see updated important information (as of April 2002)
- confirmation of precautionary designations (if applicable)
- requirements regarding priority documents (if applicable)

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

**INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE**

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated on the cover sheet of this Notification by paying national fees and furnishing translations, as prescribed by Articles 22 and 39 and the applicable national laws. In addition, the applicant may also have to comply with other special requirements applicable in certain Offices. It is the applicant's responsibility to ensure the necessary steps to enter the national phase are taken in a timely fashion. Most Offices do not issue reminders to applicants in connection with the entry into the national phase.

*1.C6* The applicable time limit for entering the national phase will, subject to what is said in the following paragraph, be 30 MONTHS from the priority date, not only in respect of any elected Office where a demand for international preliminary examination is filed before the expiration of 19 months from the priority date (see Article 39(1)), but also in respect of any designated Office, in the absence of filing of such demand, where Article 22(1) as modified with effect from 1 April 2002 applies in respect of that designated Office. For further details, see PCT Gazette No. 44/2001 of 1 November 2001, pages 19926, 19932 and 19934, as well as the PCT Newsletter, October and November 2001 and February 2002 issues.

*2-2304* In practice, time limits other than the 30-month time limit will continue to apply, for various periods of time, in respect of certain designated or elected Offices. For regular updates on the applicable time limits (20, 21, 30 or 31 months, or other time limit), Office by Office, refer to the PCT Gazette ("Section IV" part published on a weekly basis), to the PCT Newsletter (on a monthly basis) and to the relevant National Chapters in Volume II of the PCT Applicant's Guide (the paper version of which is updated usually twice a year and the Internet version of which is updated usually on a weekly basis). Finally, a cumulative table of all applicable time limits for entering the national phase is available from WIPO's Internet site, via links from various pages the site including those of the Gazette, Newsletter and Guide, at <http://www.wipo.int/pct/en/index.html>.

*3-2304* Information about the requirements for filing a demand for international preliminary examination is set out in the PCT Applicant's Guide, Volume I/A, Chapter IX. Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

**CONFIRMATION OF PRECAUTIONARY DESIGNATIONS**

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date (this time limit may not be extended). If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. The Notice of confirmation and payment must reach the receiving Office within the 15-month time limit.

**REQUIREMENTS REGARDING PRIORITY DOCUMENTS**

For applicants who have not yet complied with the requirements regarding priority documents, the following is recalled.

Where the priority of an earlier national, regional or international application is claimed, the applicant must submit a copy of the said earlier application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date, provided that any such priority document may still be submitted to the International Bureau before that date of international publication of the international application, in which case that document will be considered to have been received by the International Bureau on the last day of the 16-month time limit (Rule 17.1(a)).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request must be made before the expiration of the 16-month time limit and may be subjected by the receiving Office to the payment of a fee (Rule 17.1(b)).

If the priority document concerned is not submitted to the International Bureau or if the request to the receiving Office to prepare and transmit the priority document has not been made (and the corresponding fee, if any, paid) within the applicable time limit indicated under the preceding paragraphs, any designated State may disregard the priority claim, provided that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within the time limit which is reasonable under the circumstances.

Where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

NPN

## PATENT COOPERATION TREATY

PCT

NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

019957-015930 PC

From the INTERNATIONAL BUREAU

To:

KELLY, Beth, L.  
 Townsend and Townsend and Crew LLP  
 Two Embarcadero Center  
 8th Floor  
 San Francisco, CA 94111  
 United States of America

Date of mailing (day/month/year) 19 September 2003 (19.09.03)
Applicant's or agent's file reference 19957-159-3P
International application No. PCT/US03/23057
International publication date (day/month/year) Not yet published
Applicant NEOSE TECHNOLOGIES, INC. et al

## IMPORTANT NOTIFICATION

International filing date (day/month/year) 23 July 2003 (23.07.03)
Priority date (day/month/year) 23 July 2002 (23.07.02)

- The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
- This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
- An asterisk(\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
- The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
23 July 2002 (23.07.02)	60/398,156	US	05 Sept 2003 (05.09.03)
08 Nove 2002 (08.11.02)	60/424,894	US	08 Sept 2003 (08.09.03)

Priority Document 11-23-03  
UNDOCKETED BY Car

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer
Facsimile No. (41-22) 338.87.40	Carine SEVILLANO (Fax 022 338 87 40) Telephone No. (41-22) 338 9254

*NAN*  
**PATENT COOPERATION TREATY**

From the INTERNATIONAL BUREAU

**PCT**

**INVITATION TO CORRECT  
DECLARATION(S) MADE IN THE REQUEST  
UNDER PCT RULE 4.17**

(PCT Rules 4.17 and 26ter.2(a))

*019957-70/5930PC*

Date of mailing (day/month/year)	/19 September 2003 (19.09.03)	
Applicant's or agent's file reference	REPLY DUE <i>11-2303</i> See below	
International application No.	International filing date (day/month/year)	
PCT/US03/23057	23 July 2003 (23.07.03)	
Applicant	NEOSE TECHNOLOGIES, INC.	

1. The applicant is hereby invited to submit to the International Bureau a corrected declaration within the time limit indicated below and as explained in the Annex. The applicant's attention is drawn to the fact that the declaration has not been examined for compliance with national law requirements of the designated State(s) for which that declaration is made.

*11-2303*  
When? Within 16 months from the priority date, provided that any corrected declaration which is received by the International Bureau after the expiration of that time limit shall be considered to have been received on the last day of that time limit if it reaches it before the technical preparations for international publication have been completed (Rule 26ter.1)

How? By submitting a replacement sheet containing a corrected declaration accompanied by a letter explaining the correction (see Section 216). See Sections 211 to 215 for the applicable standardized wording.

Where? Directly to the International Bureau at the address indicated below.

If the corrected declaration is submitted to the receiving Office, that Office shall mark the date of receipt on it and transmit it promptly to the International Bureau. The declaration shall be considered to have been submitted to the International Bureau on the date marked (see Section 317).

2. Failure to correct the declaration within the time limit will result in copies of the declaration, as originally filed, being communicated by the International Bureau to the designated Offices concerned according to Rule 47.1 (a-ter).

Any declaration received after the expiration of the time limit under Rule 26ter.1 will have to be submitted by the applicant directly to the designated Offices concerned; it is only in the case of a signed declaration of inventorship for the purposes of the designation of the United States of America (Rule 4.17(iv)) that the original declaration will be returned to the applicant (see Section 419(d)).

3. In respect of national phase processing, the applicant's attention is drawn to Rule 51bis.2 which provides that the designated Office shall not, unless it may reasonably doubt the veracity of the declaration concerned, require any document or evidence relating to the subject matter of any declaration complying with Rule 4.17(i) to (iv) which is contained in the request or submitted to the International Bureau or directly to the designated Office. Note, however, that Rule 51bis.2 may not apply in respect of certain States. For further information, see Notes to the request form, Box No. VIII.

4. A copy of this invitation is being sent to the receiving Office.

*Correct Defects in Declaration*  
*DOCKETED BY CAR*

The International Bureau of WIPO 34, chemin des Colombettes, 1211 Geneva 20, Switzerland	Authorized officer Carine SEVILLANO (Fax 022 338 87 40)
Facsimile No. (41-22) 338.87.40	Telephone No. (41-22) 338.92.54

The International Bureau has found the following defect(s) in the declaration(s) listed below :

1.  declaration as to the identity of the inventor (Rules 4.17(i) and 51bis.1(a)(i) and Section 211), in respect of:
  - a. *(name(s) included in the declaration):* .....
  - is not in the prescribed wording
  - other (*specify*): .....
  - b. *(name(s) included in the declaration):* .....
  - is not in the prescribed wording
  - other (*specify*): .....
  
2.  declaration as to the applicant's entitlement, as at the international filing date, to apply for or be granted a patent (Rules 4.17(ii) and 51.bis.1(a)(ii) and Section 212), in respect of:
  - a. *(name(s) included in the declaration):* .....
  - is not in the prescribed wording
  - other (*specify*): .....
  - b. *(name(s) included in the declaration):* .....
  - is not in the prescribed wording
  - other (*specify*): .....
  
3.  declaration as to the applicant's entitlement, as at the international filing date, to claim priority of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii) and Section 213), in respect of:
  - a. *(name(s) included in the declaration):* .....
  - is not in the prescribed wording
  - other (*specify*): .....
  - b. *(name(s) included in the declaration):* .....
  - is not in the prescribed wording
  - other (*specify*): .....
  
4.  declaration of inventorship (only for the purposes of the designation of the United States of America) (Rules 4.17(iv) and 51bis.1(a)(iv) and Section 214), in respect of:
  - a. *(name(s) included in the declaration):* JOHNSON, Karl, F. @
    - is not in the prescribed wording
    - is not signed by all inventors named in the declaration
    - other (*specify*): is not dated by all inventors named in the declaration
  - b. *(name(s) included in the declaration):* .....
  - is not in the prescribed wording
  - is not signed by all inventors named in the declaration
  - other (*specify*): .....
  
5.  declaration as to non-prejudicial disclosures or exceptions to lack of novelty (Rules 4.17(v) and 51bis.1(a)(v) and Section 215), in respect of:
  - a. *(name(s) included in the declaration):* .....
  - is not in the prescribed wording
  - other (*specify*): .....
  - b. *(name(s) included in the declaration):* .....
  - is not in the prescribed wording
  - other (*specify*): .....

M6M

PCT/US2003/023057

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE

(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

Date of mailing (day/month/year) 20 October 2004 (20.10.2004)
Applicant's or agent's file reference 19957-159-3P
International application No. PCT/US2003/023057

From the INTERNATIONAL BUREAU

To: 019957-015930PC

KELLY, Beth, L.  
Townsend and Townsend and Crew LLP  
Two Embarcadero Center  
8th Floor  
San Francisco, CA 94111  
United States of America

IMPORTANT NOTIFICATION

International filing date (day/month/year)  
23 July 2003 (23.07.2003) —

1. The following indications appeared on record concerning:

the applicant     the inventor     the agent     the common representative

Name and Address GOVERNORS OF THE UNIVERSITY OF ALBERTA RASKO, David SIMLA-GRANT, Joanne TAYLOR, Diane	State of Nationality CA	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

the person     the name     the address     the nationality     the residence

Name and Address	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

The nationality of the 4 applicants and applicants/inventors listed in Box 1 is Canadian  
(CA).

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input checked="" type="checkbox"/> the designated Offices concerned
<input checked="" type="checkbox"/> the International Searching Authority	<input type="checkbox"/> the elected Offices concerned
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 338.87.40	Authorized officer  Jean-Luc MARTIN  Telephone No. (41-22) 338 9887
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## PATENT COOPERATION TREATY

*E1Q*

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

Date of mailing (day/month/year) 04 June 2004 (04.06.2004)	To: <i>019957-015930PC</i>
Applicant's or agent's file reference 19957-159-3P	<b>IMPORTANT NOTIFICATION</b>
International application No. PCT/US2003/023057	International filing date (day/month/year) 23 July 2003 (23.07.2003)

## 1. The following indications appeared on record concerning:

the applicant     the inventor     the agent     the common representative

Name and Address	State of Nationality CA	State of Residence CA
	Telephone No. 780-492-5787	
	Faximile No. 780-492-7876	
	Teleprinter No.	

## 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

the person     the name     the address     the nationality     the residence

Name and Address GOVERNORS OF THE UNIVERSITY OF ALBERTA 222 Campus Tower 8625-112th Street Edmonton, Alberta Canada T6G 2E1 Canada	State of Nationality **	State of Residence **
	Telephone No. 780-492-5787	
	Faximile No. 780-492-7876	
	Teleprinter No.	

## 3. Further observations, if necessary:

Added new Applicant for NS US

## 4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input checked="" type="checkbox"/> the designated Offices concerned
<input checked="" type="checkbox"/> the International Searching Authority	<input type="checkbox"/> the elected Offices concerned
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 338.87.40	Authorized officer Kishan SINGH RAM Telephone No. (41-22) 338 8450
--	--

10/521138  
OT12 Rec'd PCT/PCTO, 2 JAN 2005

TOWNSEND  
and  
TOWNSEND  
and  
**CREW**  
LLP

30 September 2004

**VIA FACSIMILE TO 011 (41.22) 338.8740**  
**CONFIRMATION VIA FEDERAL EXPRESS**

Officer Kishan Singh Ram  
The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Re: International Application No. PCT/US2003/023057  
Title: H. PYLORI FUCOSYLTRANSFERASES  
Applicant: Neose Technologies, Inc.  
International Filing Date: 23 July 2003  
Our File No.: 19957-159-3P

Dear Officer Singh Ram:

In response to the Communication In Cases For Which No Other Form Is Applicable dated 04 June 2004, the following is the Nationality for the four new additions to the above-referenced application:

{ Joanne SIMALA-GRANT - Canadian  
Diane TAYLOR - Canadian  
David RASKO - Canadian  
→Governors of The University of Alberta - Canadian

Thank you for your attention to this matter.

Respectfully submitted,

TOWNSEND and TOWNSEND and CREW LLP

  
Beth L. Kelly  
Reg. No. 51,868

BLK/m6m

60321011V1

Palo Alto, California  
Tel 650 326-2400  
Walnut Creek, California  
Tel 925 472-5000  
San Diego, California  
Tel 858-350-6100  
Denver, Colorado  
Tel 303 571-4000  
Seattle, Washington  
Tel 206 467-9600

San Francisco  
Two Embarcadero Center  
8th Floor  
San Francisco  
California 94111-3834  
Tel 415 576-0200  
Fax 415 576-0300

*E7W*  
**PATENT COOPERATION TREATY**

From the INTERNATIONAL BUREAU

**PCT**

**COMMUNICATION IN CASES FOR WHICH  
NO OTHER FORM IS APPLICABLE**

*019957-015930PC*

Date of mailing (day/month/year) 04 June 2004 (04.06.2004)	To:  KELLY, Beth, L. Townsend and Townsend and Crew LLP Two Embarcadero Center 8th Floor San Francisco, CA 94111 ETATS-UNIS D'AMERIQUE
Applicant's or agent's file reference 19957-159-3P	<b>REPLY DUE</b> see paragraph 1 below
International application No. PCT/US2003/023057	International filing date (day/month/year) 23 July 2003 (23.07.2003)
Applicant NEOSE TECHNOLOGIES, INC.	

1.  REPLY DUE within \_\_\_\_\_ months/days from the above date of mailing  
 NO REPLY DUE, however, see below  
 IMPORTANT COMMUNICATION  
 INFORMATION ONLY
  
2. COMMUNICATION:

The International Bureau hereby acknowledges the receipt of 92bis changes and Powers of Attorney received on 13 May 2004. The requested changes have been recorded but Nationality and Residence for all the four new additions are still awaited.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 338.87.40	Authorized officer  Kishan SINGH RAM  Telephone No. (41-22) 338.84.50
--	---

## PATENT COOPERATION TREATY

*E2Q*

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

Date of mailing (day/month/year) 04 June 2004 (04.06.2004)	To: <i>019957-01593OPC</i>
Applicant's or agent's file reference 19957-159-3P	<b>IMPORTANT NOTIFICATION</b>
International application No. PCT/US2003/023057	International filing date (day/month/year) 23 July 2003 (23.07.2003)

1. The following indications appeared on record concerning:				
<input checked="" type="checkbox"/> the applicant <input checked="" type="checkbox"/> the inventor <input type="checkbox"/> the agent <input type="checkbox"/> the common representative				
Name and Address		State of Nationality		State of Residence
		**		**
		Telephone No.		
		Facsimile No.		
Teleprinter No.				
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:				
<input checked="" type="checkbox"/> the person <input checked="" type="checkbox"/> the name <input checked="" type="checkbox"/> the address <input checked="" type="checkbox"/> the nationality <input checked="" type="checkbox"/> the residence				
Name and Address TAYLOR, Diane 3911 118 Street Edmonton, Alberta Canada T6J 1X2 Canada		State of Nationality		State of Residence
		**		**
		Telephone No.		
		Facsimile No.		
Teleprinter No.				
3. Further observations, if necessary: Added new applicant and inventor for US only.				
4. A copy of this notification has been sent to:				
<input checked="" type="checkbox"/> the receiving Office <input checked="" type="checkbox"/> the International Searching Authority <input type="checkbox"/> the International Preliminary Examining Authority		<input checked="" type="checkbox"/> the designated Offices concerned <input type="checkbox"/> the elected Offices concerned <input type="checkbox"/> other:		

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 338.87.40	Authorized officer Kishan SINGH RAM Telephone No. (41-22) 338 8450
--	--

## PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

Date of mailing (day/month/year) 04 June 2004 (04.06.2004)	To: <i>019957-015930PC</i>
Applicant's or agent's file reference 19957-159-3P	<b>IMPORTANT NOTIFICATION</b>
International application No. PCT/US2003/023057	International filing date (day/month/year) 23 July 2003 (23.07.2003)

1. The following indications appeared on record concerning:				
<input checked="" type="checkbox"/> the applicant <input checked="" type="checkbox"/> the inventor <input type="checkbox"/> the agent <input type="checkbox"/> the common representative				
Name and Address  SIMLA-GRANT, Joanne 10115 87 Avenue Edmonton, Alberta Canada T6E 2P3 Canada		State of Nationality **		State of Residence **
		Telephone No.		
		Facsimile No.		
		Teleprinter No.		
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:				
<input checked="" type="checkbox"/> the person <input checked="" type="checkbox"/> the name <input checked="" type="checkbox"/> the address <input checked="" type="checkbox"/> the nationality <input checked="" type="checkbox"/> the residence				
Name and Address  SIMLA-GRANT, Joanne 10115 87 Avenue Edmonton, Alberta Canada T6E 2P3 Canada		State of Nationality **		State of Residence **
		Telephone No.		
		Facsimile No.		
		Teleprinter No.		

3. Further observations, if necessary: Added new applicant and inventor for US only.				
4. A copy of this notification has been sent to:				
<input checked="" type="checkbox"/> the receiving Office <input checked="" type="checkbox"/> the International Searching Authority <input type="checkbox"/> the International Preliminary Examining Authority		<input checked="" type="checkbox"/> the designated Offices concerned <input type="checkbox"/> the elected Offices concerned <input type="checkbox"/> other:		

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 338.87.40	Authorized officer  Kishan SINGH RAM  Telephone No. (41-22) 338 8450
--	--

## PATENT COOPERATION TREATY

PCT

**NOTIFICATION OF THE RECORDING  
OF A CHANGE**(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

Date of mailing (day/month/year) 04 June 2004 (04.06.2004)	To: <i>019957-015930PC</i>  KELLY, Beth, L. Townsend and Townsend and Crew LLP Two Embarcadero Center 8th Floor San Francisco, CA 94111 United States of America
Applicant's or agent's file reference 19957-159-3P	<b>IMPORTANT NOTIFICATION</b>
International application No. PCT/US2003/023057	International filing date (day/month/year) 23 July 2003 (23.07.2003)

1. The following indications appeared on record concerning:				
<input checked="" type="checkbox"/> the applicant <input checked="" type="checkbox"/> the inventor <input type="checkbox"/> the agent <input type="checkbox"/> the common representative				
Name and Address     	State of Nationality **		State of Residence **	
	Telephone No.			
	Facsimile No.			
	Teleprinter No.			

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:				
<input checked="" type="checkbox"/> the person <input checked="" type="checkbox"/> the name <input checked="" type="checkbox"/> the address <input checked="" type="checkbox"/> the nationality <input checked="" type="checkbox"/> the residence				
Name and Address  RASKO, David 2500 Clarendon Boulevard Apartment 627 Arlington, VA 22201 United States of America	State of Nationality **		State of Residence **	
	Telephone No.			
	Facsimile No.			
	Teleprinter No.			

3. Further observations, if necessary: <b>Added new applicant and inventor for US only.</b>				
--	--	--	--	--

4. A copy of this notification has been sent to:				
<input checked="" type="checkbox"/> the receiving Office <input checked="" type="checkbox"/> the International Searching Authority <input type="checkbox"/> the International Preliminary Examining Authority		<input checked="" type="checkbox"/> the designated Offices concerned <input type="checkbox"/> the elected Offices concerned <input type="checkbox"/> other:		

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 338.87.40	Authorized officer  Kishan SINGH RAM  Telephone No. (41-22) 338 8450
--	--

TRANSMITTAL LETTER OF THE  
UNITED STATES RECEIVING OFFICE

DATE	February 2004
INTERNATIONAL APPL. NO.	PCT/US03/23057
ATTY DOCKET NO.	19557-159-3P

10/521138

I. Certification under 37 CFR 1.10 (if applicable)

DT12 Rec'd PCT/PTO , 2 JAN 2005

EV 330 851 543 US

23 February 2004

Express Mail mailing number

Date of Deposit

II.  New International Application

Title		Earliest priority date (Day/Month/Year)

**SCREENING DISCLOSURE INFORMATION:** In order to assist in screening the accompanying international application for purposes of determining whether a license for foreign transmittal should and could be granted and for other purposes, the following information is supplied. (Note: check as many boxes as apply):

- A.  The invention disclosed was not made in the United States.
- B.  There is no prior U.S. application relating to this invention.
- C.  The following prior U.S. application(s) contain subject matter which is related to the invention disclosed in the attached international application. (NOTE: *priority to these applications may or may not be claimed on form PCT/RO/101 (Request) and this listing does not constitute a claims for priority*).

application no.		filed on	
application no.		filed on	

- D.  The present international application  contains additional subject matter not found in the prior U.S. application(s) identified in paragraph C above. The additional subject matter is found on pages: \_\_\_\_\_ and  DOES NOT ALTER  MIGHT BE CONSIDERED TO ALTER the general nature of the invention in a manner which would require the U.S. application to have been made available for inspection by the appropriate defense agencies under 35 USC 181 and 37 CFR 5.1. See 37 CFR 5.15.

III.  A Response to an Invitation from the RO/US. The following document(s) is (are) enclosed:

- A.  A Request for an Extension of Time to File a Response.
- B.  A Power of Attorney (General or Regular)
- C.  Replacement pages:

pages	of the request (PCT/RO/101)	pages	of the figures
pages	of the description	pages	of the abstract
pages	of the claims		

D.  Submission of Priority Documents

Priority document	Priority document
-------------------	-------------------

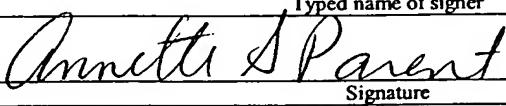
E.  Fees as specified on attached Fee Calculation sheet form PCT/RO/101 annex

IV.  A Request for rectification under PCT 91       A Petition       A Sequence Listing Diskette

- V.  Other (please specify):  Postcard  Chapter II Demand  Letter to USPTO Officer  
 Art. 34 Amendment with eight (8) substitute specification pages 4, 5, 5a, 12, 34, 36, 36a, and 37 (w/ red-lined copies)

The Commissioner is hereby authorized to charge any additional fees associated with this paper or during the pendency of this application, or credit any overpayment, to Deposit Account No. 20-1430.

The person  
signing  
this form is  
the

<input type="checkbox"/> Applicant	Annette S. Parent
<input checked="" type="checkbox"/> Attorney/Agent (Reg. No.) 42,058	Typed name of signer
<input type="checkbox"/> Common Representative	 Signature

10/521158

DTI2 Rec'd 16/1/04 2 JAN 2005

San Francisco

TOWNSEND  
and  
TOWNSEND  
and  
CREW

LLP

Denver, Colorado  
Tel 303 571-4000

Palo Alto, California  
Tel 650 326-2400

Seattle, Washington  
Tel 206 467-9600

Two Embarcadero Center  
Eighth Floor  
San Francisco  
California 94111-3634  
Tel 415 576-0200  
Fax 415 576-0300

23 February 2004

**VIA EXPRESS MAIL, WITH RETURN POSTCARD ENCLOSED**

PCT International Application Processing Div.  
USPTO International Division  
Assistant Commissioner for Patents  
Mail Stop PCT  
PO Box 1450  
Alexandria, VA 22313-1450

Re: International Application No. PCT/US03/23057  
Title: H. PYLORI FUCOSYLTRANSFERASES  
Applicant(s): NEOSE TECHNOLOGIES, INC. and GOVERNORS OF THE UNIVERSITY  
OF ALBERTA *et al.*  
International Filing Date: 23 July 2003  
Express Mail Label No.: EV 330 851 543 US  
Date of Mailing: 23 February 2004  
Our File No.: 19957-159-3P

Dear Officer:

Enclosed are the Chapter II Demand and eight (8) substitute specification pages 4, 5, 5a, 12, 34, 36, 36a, and 37 submitted as an Article 34 Amendment for the above-referenced patent application. The only changes were insertions of SEQ ID:NOs. and/or corrections of typographical errors that do not include matter which go beyond the disclosure in the international application as filed.

Thank you for your attention to this matter.

Respectfully submitted,

TOWNSEND and TOWNSEND and CREW LLP

Annette S. Parent  
Reg. No. 42,058

ASP/nan

Enclosures:

Chapter II Demand  
Eight (8) substitute specification pages 4, 5, 5a, 12, 34, 36, 36a, and 37  
(with red-lined copies)  
Thirty-nine (39) pages of Sequence Listing, Statement and Diskette  
Transmittal Letter and Postcard

60144732 v1

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ US

# PCT

## CHAPTER II

### DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty.

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference 19957-159-3P
International application No. PCT/US03/23057	International filing date (day/month/year) 23 July 2003 (23.07.03)	(Earliest) Priority date (day/month/year) 23 July 2002 (23.07.02)
Title of invention <b>H. PYLORI FUCOSYLTRANSFERASES</b>		
Box No. II APPLICANT(S)		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) NEOSE TECHNOLOGIES, INC. 102 Witmer Road Horsham, Pennsylvania 19044 United States of America		Telephone No.: 215.773.6984 Facsimile No.: 215.773.6983 Teleprinter No.: Applicant's registration No. with the Office
State (that is, country) of nationality: US	State (that is, country) of residence: US	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) GOVERNORS OF THE UNIVERSITY OF ALBERTA 222 Campus Tower 8625 112th Street Edmonton, Alberta Canada T6G 2E1		
State (that is, country) of nationality: CA	State (that is, country) of residence: CA	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) RASKO, David 2500 Clarendon Boulevard, Apt. 627 Arlington, Virginia 22201 United States of America		
State (that is, country) of nationality: CA	State (that is, country) of residence: US	
<input checked="" type="checkbox"/> Further applicants are indicated on a continuation sheet.		

## Continuation of Box No. II

## APPLICANT(S)

*If none of the following sub-boxes is used, this sheet should not be included in the demand.*

Name and address: (*Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.*)

SIMALA-GRANT, Joanne  
10115 87 Avenue  
Edmonton, Alberta  
Canada T6E 2P3

State (*that is, country*) of nationality:

CA

State (*that is, country*) of residence:

CA

Name and address: (*Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.*)

TAYLOR, Diane  
3911 118 Street  
Edmonton, Alberta  
Canada T6J 1X2

State (*that is, country*) of nationality:

CA

State (*that is, country*) of residence:

CA

Name and address: (*Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.*)

JOHNSON, Karl, F.  
5320 Ivystream Road  
Hatboro, Pennsylvania 19040  
United States of America

State (*that is, country*) of nationality:

US

State (*that is, country*) of residence:

US

Name and address: (*Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.*)

BEZILA, Daniel, James  
715 Red Lion Road, 2nd Floor  
Philadelphia, Pennsylvania 19115  
United States of America

State (*that is, country*) of nationality:

US

State (*that is, country*) of residence:

US

Name and address: (*Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.*)

State (*that is, country*) of nationality:

State (*that is, country*) of residence:

Further applicants are indicated on another continuation sheet.

**Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**

The following person is  agent  common representative

and  has been appointed earlier and represents the applicant(s) also for international preliminary examination.

is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: (*Family name followed by given name; for a legal entity, full official designation.  
The address must include postal code and name of country.*)

PARENT, Annette, S.

TOWNSEND AND TOWNSEND AND CREW LLP

Two Embarcadero Center, Eighth Floor

San Francisco, California 94111-3834

United States of America

Telephone No.:

415.576.0200

Faxsimile No.:

415.576.0300

Teleprinter No.:

Agent's registration No. with the Office

42,058

Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:\***

1. The applicant wishes the international preliminary examination to start on the basis of:

the international application as originally filed

the description  as originally filed

as amended under Article 34

the claims  as originally filed

as amended under Article 19 (together with any accompanying statement)

as amended under Article 34

the drawings  as originally filed

as amended under Article 34

2.  The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3.  The applicant wishes the start of the international preliminary examination to be postponed until the expiration of applicable time limit under Rule 69.1(d).

- \* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: ENGLISH

which is the language in which the international application was filed.

which is the language of a translation furnished for the purposes of international search.

which is the language of publication of the international application.

which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

**Box No. V ELECTION OF STATES**

The filing of this demand constitutes the election of all Contracting States which are designated and are bound by Chapter II of the PCT.

**Box No. VI CHECK LIST**

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

			For International Preliminary Examining Authority use only	
			received	not received
1. translation of international application	:	sheets	<input type="checkbox"/>	<input type="checkbox"/>
2. amendments under Article 34	:	8 sheets	<input type="checkbox"/>	<input type="checkbox"/>
3. copy (or, where required, translation) of amendments under Article 19	:	sheets	<input type="checkbox"/>	<input type="checkbox"/>
4. copy (or, where required, translation) of statement under Article 19	:	sheets	<input type="checkbox"/>	<input type="checkbox"/>
5. letter	:	1 sheet	<input type="checkbox"/>	<input type="checkbox"/>
6. other (specify)	:	sheets	<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- |  |  |
|--|--|
| 1. <input checked="" type="checkbox"/> fee calculation sheet                               | 5. <input type="checkbox"/> statement explaining lack of signature   |
| 2. <input type="checkbox"/> original separate power of attorney                            | 6. <input type="checkbox"/> sequence listing in computer readable form   |
| 3. <input type="checkbox"/> original general power of attorney                             | 7. <input checked="" type="checkbox"/> tables in computer readable form related to a sequence listing  |
| 4. <input type="checkbox"/> copy of general power of attorney; reference number, if any: ; | 8. <input checked="" type="checkbox"/> other (specify): Transmittal Letter, Article 34 Amendment with eight (8) substitute specification pages 4, 5, 5a, 12, 34, 36, 36a, and 37 (w/ red-lined copies); Thirty-nine (39) pages of Sequence Listing, Statement and Diskette; Postcard |

**Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE**

*Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).*

X Annette S. Parent

Annette S. Parent

TOWNSEND AND TOWNSEND AND CREW LLP

USPTO Reg. No.: 42,058

Applicants' Agent

For International Preliminary Examining Authority use only

For International Preliminary Examining Authority use only	
1. Date of actual receipt of DEMAND:	
2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):	
3. <input type="checkbox"/> The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. <input type="checkbox"/> The applicant has been informed accordingly.	6. <input type="checkbox"/> The date of receipt of the demand is AFTER the expiration of the time limit under Rule 54bis.1(a) and item 7 or 8, below, does not apply
4. <input type="checkbox"/> The date of receipt of the demand is WITHIN the time limit of 19 months from the priority date as extended by virtue of Rule 80.5.	7. <input type="checkbox"/> The date of receipt of the demand is WITHIN the time limit under Rule 54bis.1(a) as extended by virtue of Rule 80.5.
5. <input type="checkbox"/> Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.	8. <input type="checkbox"/> Although the date of receipt of the demand is after the expiration of the time limit under Rule 54bis.1(a), the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

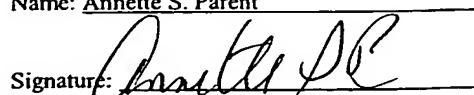
Demand received from IPEA on:

## PCT

## FEE CALCULATION SHEET

## Annex to the Demand

For International Preliminary Examining Authority use only

International application No.	PCT/US03/23057	Date stamp of the IPEA
Applicant's or agent's file reference	19957-159-3P	
Applicant NEOSE TECHNOLOGIES, INC. <i>et al.</i>		
<b>CALCULATION OF PRESCRIBED FEES</b>		
1. Preliminary examination fee .....	600.00	P
2. Handling fee ( <i>Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.</i> ).....	148.00	H
3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box .....	748.00	TOTAL
<b>MODE OF PAYMENT</b>		
<input checked="" type="checkbox"/> authorization to charge deposit account with the IPEA (see below)	<input type="checkbox"/> cash	
<input type="checkbox"/> cheque	<input type="checkbox"/> revenue stamps	
<input type="checkbox"/> postal money order	<input type="checkbox"/> coupons	
<input type="checkbox"/> bank draft	<input type="checkbox"/> other ( <i>specify</i> ):	
<b>AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT</b> <i>(This mode of payment may not be available at all IPEAs)</i>		IPEA/ US _____
<input checked="" type="checkbox"/> Authorization to charge the total fees indicated above.		Deposit Account No.: 20-1430 _____
<input checked="" type="checkbox"/> <i>deposit accounts of the IPEA so permit</i> ) Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.		Date: 23 February 2004 _____
		Name: Annette S. Parent _____
		Signature: 

fucose residue from a donor substrate to glucose. In one aspect, the fucosyltransferase proteins comprise SEQ ID NO:2, 4, 6, or 8. In another aspect the fucosyltranferase proteins also include an amino acid tag.

[0014] In another embodiment the invention provides recombinant fucosyltransferase proteins that include SEQ ID NO:12, and that catalyzes the transfer of a fucose residue from a donor substrate to glucose. In another aspect the fucosyltranferase proteins also include an amino acid tag.

[0015] The present invention also provides methods to use the above  $\alpha$ -1,3/4-fucosyltransferase protein to produce fucosylated oligosaccharides. The fucosylated oligosaccharides can be further purified. The acceptor substrate can be either N-acetylglucosamine or glucose depending on the needs of the user. In one embodiment the acceptor substrate is Lacto-N-neo-Tetraose (LNnT) and the fucosylated product is Lacto-N-Fucopentaose III (LNFP III). The  $\alpha$ -1,3/4-fucosyltransferase can be used in combination with other glycosyltransferases to produce a fucosylated oligosaccharide. For example, using lactose as a starting material, LNFP can be produced through the action of an  $\alpha$ -1,3/4-fucosyltransferase that transfers fucose to N-acetylglucosamine, a  $\beta$ -1,3-N-acetylglucosaminyltransferase, and a  $\beta$ -1,4-galactosyltransferase. The  $\beta$ -1,3-N-acetylglucosaminyltransferase and the  $\beta$ -1,4-galactosyltransferase can be bacterial enzymes and in a preferred embodiment are from *Neisseria gonococcus*.

[0016] In another embodiment, the  $\alpha$ -1,3/4-fucosyltransferase protein of the present invention are used to produce fucosylated glycolipids. The acceptor substrate can be either N-acetylglucosamine or glucose depending on the needs of the user.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Figure 1 provides the nucleic acid (SEQ ID NO:1) and amino acid (SEQ ID NO:2) sequences of fucosyltranferase from *H. pylori* strain 1182B.

[0018] Figure 2 provides the nucleic acid (SEQ ID NO:3) and amino acid (SEQ ID NO:4) sequences of fucosyltranferase from *H. pylori* strain 1111A.

[0019] Figure 3 provides the nucleic acid (SEQ ID NO:5) and amino acid (SEQ ID NO:6) sequences of fucosyltranferase from *H. pylori* strain 1218B.

[0020] Figure 4 provides the nucleic acid (SEQ ID NO:7) and amino acid (SEQ ID NO:8) sequences of fucosyltranferase from *H. pylori* strain 19C2B.

fucose residue from a donor substrate to glucose. In one aspect, the fucosyltransferase proteins comprise SEQ ID NO:2, 4, 6, or 8. In another aspect the fucosyltransferase proteins also include an amino acid tag.

[0014] In another embodiment the invention provides recombinant fucosyltransferase 5 proteins that include SEQ ID NO:12, and that catalyzes the transfer of a fucose residue from a donor substrate to glucose. In another aspect the fucosyltransferase proteins also include an amino acid tag.

[0015] The present invention also provides methods to use the above  $\alpha$ -1,3/4-fucosyltransferase protein to produce fucosylated oligosaccharides. The fucosylated 10 oligosaccharides can be further purified. The acceptor substrate can be either N-acetylglucosamine or glucose depending on the needs of the user. In one embodiment the acceptor substrate is Lacto-N-neo-Tetraose (LNnT) and the fucosylated product is Lacto-N-Fucopentaose III (LNFP III). The  $\alpha$ -1,3/4-fucosyltransferase can be used in combination with other glycosyltransferases to produce a fucosylated oligosaccharide. For example, using 15 lactose as a starting material, LNFP can be produced through the action of an  $\alpha$ -1,3/4-fucosyltransferase that transfers fucose to N-acetylglucosamine, a  $\beta$ -1,3-N-acetylglucosaminyltransferase, and a  $\beta$ -1,4-galactosyltransferase. The  $\beta$ -1,3-N-acetylglucosaminyltransferase and the  $\beta$ -1,4-galactosyltransferase can be bacterial enzymes and in a preferred embodiment are from *Neisseria gonococcus*.

20 [0016] In another embodiment, the  $\alpha$ -1,3/4-fucosyltransferase protein of the present invention are used to produce fucosylated glycolipids. The acceptor substrate can be either N-acetylglucosamine or glucose depending on the needs of the user.

#### BRIEF DESCRIPTION OF THE DRAWINGS

(SEQ ID NO:1) (SEQ ID NO:2)  
[0017] Figure 1 provides the nucleic acid and amino acid sequences of fucosyltransferase 25 from *H. pylori* strain 1182B.

(SEQ ID NO:3) (SEQ ID NO:4)  
[0018] Figure 2 provides the nucleic acid and amino acid sequences of fucosyltransferase from *H. pylori* strain 1111A.

(SEQ ID NO:5) (SEQ ID NO:6)  
[0019] Figure 3 provides the nucleic acid and amino acid sequences of fucosyltransferase from *H. pylori* strain 1218B.

30 (SEQ ID NO:7) (SEQ ID NO:8)  
[0020] Figure 4 provides the nucleic acid and amino acid sequences of fucosyltransferase from *H. pylori* strain 19C2B.

[0021] Figure 5 provides the nucleic acid (SEQ ID NO:9) and amino acid (SEQ ID NO:10) sequences of fucosyltransferase from *H. pylori* strain 915A.

[0022] Figure 6 provides the nucleic acid (SEQ ID NO:11) and amino acid (SEQ ID NO:12) sequences of fucosyltransferase from *H. pylori* strain 26695A.

5 [0023] Figure 7 provides the nucleic acid (SEQ ID NO:13) and amino acid (SEQ ID NO:14) sequences of fucosyltransferase from *H. pylori* strain 19C2A.

10 [0024] Figure 8 provides an alignment between 1182 futB amino acid sequence (SEQ ID NO:15) and a consensus sequence from the glycosyltransferase family 10 (SEQ ID NO:16), *i.e.*, the fucosyltransferase family. Amino acids 23 through 305 of 1182 futB are shown in the top line and represent the most conserved region of the protein, *i.e.* the fucosyltransferase catalytic domain.

15 [0025] Figure 9 provides an alignment between 1111 futA amino acid sequence (SEQ ID NO:17) and a consensus sequence from the glycosyltransferase family 10 (SEQ ID NO:18), *i.e.*, the fucosyltransferase family. Amino acids 27 through 417 of 1182 futB are shown in the top line and represent the most conserved region of the protein, *i.e.* the fucosyltransferase catalytic domain.

20 [0026] Figure 10 provides an alignment between 1218 futB amino acid sequence (SEQ ID NO:19) and a consensus sequence from the glycosyltransferase family 10 (SEQ ID NO:20), *i.e.*, the fucosyltransferase family. Amino acids 23 through 399 of 1182 futB are shown in the top line and represent the most conserved region of the protein, *i.e.* the fucosyltransferase catalytic domain.

25 [0027] Figure 11 provides an alignment between 19C2 futB amino acid sequence (SEQ ID NO:21) and a consensus sequence from the glycosyltransferase family 10 (SEQ ID NO:22), *i.e.*, the fucosyltransferase family. Amino acids 23 through 377 of 1182 futB are shown in the top line and represent the most conserved region of the disclosed protein, *i.e.* the fucosyltransferase catalytic domain.

30 [0028] Figure 12 provides an alignment between amino acid sequence of *H. pylori* strains 1182 FutB (SEQ ID NO:25), 1111 FutA (SEQ ID NO:23), 1218 FutB (SEQ ID NO:26), 19C2 FutB (SEQ ID NO:27), 915FutA (SEQ ID NO:10), 19C2 FutA (SEQ ID NO:14), and 26695 FutA (SEQ ID NO:24). The bottom sequence is a consensus sequence (SEQ ID NOS:28-37).

[0029] Figure 13 provides an alignment between nucleic acid sequence of *H. pylori* strains 1182 FutB (SEQ ID NO:1), 1111 FutA (SEQ ID NO:3), 1218 FutB (SEQ ID NO:5), 19C2 FutB (SEQ ID NO:7), 915FutA (SEQ ID NO:38), 19C2 FutA (SEQ ID NO:13), and 26695 FutA (SEQ ID NO:11). The bottom sequence is a consensus sequence (SEQ ID NOS:39-74).

[0021] Figure 5 provides the nucleic acid and amino acid sequences of fucosyltransferase from *H. pylori* strain 915A.

[0022] Figure 6 provides the nucleic acid and amino acid sequences of fucosyltransferase from *H. pylori* strain 26695A.

5 [0023] Figure 7 provides the nucleic acid and amino acid sequences of fucosyltransferase from *H. pylori* strain 19C2A.

[0024] Figure 8 provides an alignment between 1182 futB amino acid sequence and a consensus sequence from the glycosyltransferase family 10, i.e., the fucosyltransferase family. Amino acids 23 through 305 of 1182 futB are shown in the top line and represent the most conserved region of the protein, i.e. the fucosyltransferase catalytic domain.

10 [0025] Figure 9 provides an alignment between 1111 futA amino acid sequence and a consensus sequence from the glycosyltransferase family 10, i.e., the fucosyltransferase family. Amino acids 27 through 417 of 1182 futB are shown in the top line and represent the most conserved region of the protein, i.e. the fucosyltransferase catalytic domain.

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25 [0028] Figure 12 provides an alignment between amino acid sequence of *H. pylori* strains 1182 FutB, 1111 FutA, 1218 FutB, 19C2 FutB, 915FutA, 19C2 FutA, and 26695 FutA. The bottom sequence is a consensus sequence.

[0029] Figure 13 provides an alignment between nucleic acid sequence of *H. pylori* strains 1182 FutB, 1111 FutA, 1218 FutB, 19C2 FutB, 915FutA, 19C2 FutA, and 26695 FutA. The bottom sequence is a consensus sequence.

to the cell that has been modified without removing the nucleic acid from the cell; such modifications include those obtained by gene replacement, site-specific mutation, and related techniques. A "recombinant protein" is one which has been produced by a recombinant cell.

[0051] A "fusion protein" refers to an *H. pylori* fucosyltransferase protein comprising 5 amino acid sequences that are in addition to, in place of, less than, and/or different from the amino acid sequences encoding the original or native full-length protein or subsequences thereof.

[0052] Components of fusion proteins include "accessory enzymes" and/or "purification or amino acid tags." An "accessory enzyme" as referred to herein, is an enzyme that is involved 10 in catalyzing a reaction that, for example, forms a substrate for a fucosyltransferase. An accessory enzyme can, for example, catalyze the formation of a nucleotide sugar that is used as a donor moiety by a fucosyltransferase, e.g., GDP-fucose. An accessory enzyme can also be one that is used in the generation of a nucleotide triphosphate required for formation of a nucleotide sugar, or in the generation of the sugar which is incorporated into the nucleotide 15 sugar, e.g., fucose. The recombinant fusion protein of the invention can be constructed and expressed as a fusion protein with a molecular "purification tag" at one end, which facilitates purification of the protein. Such tags can also be used for immobilization of a protein of interest during the glycosylation reaction. Suitable tags include "epitope tags," which are a protein sequence that is specifically recognized by an antibody. Epitope tags are generally 20 incorporated into fusion proteins to enable the use of a readily available antibody to unambiguously detect or isolate the fusion protein. A "FLAG tag" is a commonly used epitope tag, specifically recognized by a monoclonal anti-FLAG antibody, consisting of the sequence AspTyrLysAspAspAspAspLys (SEQ ID NO:75) or a substantially identical variant thereof. Other suitable tags are known to those of skill in the art, and include, for example, 25 an affinity tag such as a hexahistidine (SEQ ID NO:76) peptide, which will bind to metal ions such as nickel or cobalt ions. Purification tags also include maltose binding domains and starch binding domains. Purification of maltose binding domain proteins is known to those of skill in the art. Starch binding domains are described in WO 99/15636, herein incorporated by reference. Affinity purification of a fusion protein comprising a starch binding domain 30 using a betacylodextrin (BCD)-derivatized resin is described in USSN 60/468,374, filed May 5, 2003, herein incorporated by reference in its entirety.

to the cell that has been modified without removing the nucleic acid from the cell; such modifications include those obtained by gene replacement, site-specific mutation, and related techniques. A "recombinant protein" is one which has been produced by a recombinant cell.

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[0117] To facilitate purification of the *H. pylori*  $\alpha$ -1,3/4-fucosyltransferase proteins of the invention, the nucleic acids that encode the fusion proteins can also include a coding sequence for an epitope or “tag” for which an affinity binding reagent is available, i.e. a purification tag. Examples of suitable epitopes include the myc and V-5 reporter genes; 5 expression vectors useful for recombinant production of fusion proteins having these epitopes are commercially available (e.g., Invitrogen (Carlsbad CA) vectors pcDNA3.1/Myc-His and pcDNA3.1/V5-His are suitable for expression in mammalian cells). Additional expression vectors suitable for attaching a tag to the *H. pylori*  $\alpha$ -1,3/4-fucosyltransferase proteins of the invention, and corresponding detection systems are known to those of skill in the art, and 10 several are commercially available (e.g., FLAG" (Kodak, Rochester NY). Another example of a suitable tag is a polyhistidine sequence, which is capable of binding to metal chelate affinity ligands. Typically, six adjacent histidines (SEQ ID NO:76) are used, although one can use more or less than six. Suitable metal chelate affinity ligands that can serve as the binding moiety for a polyhistidine tag include nitrilo-tri-acetic acid (NTA) (Hochuli, E. 15 (1990) “Purification of recombinant proteins with metal chelating adsorbents” In Genetic Engineering: Principles and Methods, J.K. Setlow, Ed., Plenum Press, NY; commercially available from Qiagen (Santa Clarita, CA)).

[0118] Purification tags also include maltose binding domains and starch binding domains. Purification of maltose binding domain proteins is known to those of skill in the art. Starch 20 binding domains are described in WO 99/15636, herein incorporated by reference. Affinity purification of a fusion protein comprising a starch binding domain using a betacylodextrin (BCD)-derivatized resin is described in USSN 60/468,374, filed May 5, 2003, herein incorporated by reference in its entirety.

[0119] Other haptens that are suitable for use as tags are known to those of skill in the art 25 and are described, for example, in the Handbook of Fluorescent Probes and Research Chemicals (6th Ed., Molecular Probes, Inc., Eugene OR). For example, dinitrophenol (DNP), digoxigenin, barbiturates (see, e.g., US Patent No. 5,414,085), and several types of fluorophores are useful as haptens, as are derivatives of these compounds. Kits are commercially available for linking haptens and other moieties to proteins and other 30 molecules. For example, where the hapten includes a thiol, a heterobifunctional linker such as SMCC can be used to attach the tag to lysine residues present on the capture reagent.

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or reverse osmotic membrane as described in commonly assigned AU Patent No. 735695 may be used. As a further example, membrane filtration wherein the membranes have a molecular weight cutoff of about 1000 to about 10,000 Daltons can be used to remove proteins. As another example, nanofiltration or reverse osmosis can then be used to remove  
5 salts. Nanofilter membranes are a class of reverse osmosis membranes which pass monovalent salts but retain polyvalent salts and uncharged solutes larger than about 200 to about 1000 Daltons, depending upon the membrane used. Thus, for example, the oligosaccharides produced by the compositions and methods of the present invention can be retained in the membrane and contaminating salts will pass through.

10 **F. Donor Substrates and Acceptor Substrates**

[0124] Suitable donor substrates used by the *H. pylori* fucosyltransferase proteins and other glycosyltransferases in the methods of the invention include, but are not limited to, UDP-Glc, UDP-GlcNAc, UDP-Gal, UDP-GalNAc, GDP-Man, GDP-Fuc, UDP-GlcUA, and CMP-sialic acid. Guo *et al.*, *Applied Biochem. and Biotech.* 68: 1-20 (1997)

15 [0125] Suitable acceptor substrates used by the *H. pylori* fucosyltransferase proteins and methods of the invention include, but are not limited to, polysaccharides, oligosaccharides, lipids, and glycolipids. For example, the oligosaccharide LNnT can be fucosylated to form LNFIII. The fucosyltransferases described herein can also be used in multienzyme systems to produce a desired product from a convenient starting material. For example, LNFIII was  
20 prepared on a multigram scale from lactose using the *H. pylori*  $\alpha$ -1,3/4-fucosyltransferases from strain 1182 described herein, in combination with *Neisseria gonococcus*  $\beta$ -1,3N-acetylglucosaminyltransferase (IgtA) and *Neisseria gonococcus*  $\beta$ -1,4-galactosyltransferase (IgtB).

25 [0126] The recombinant fusion protein of the invention can be constructed and expressed as a fusion protein with a molecular “tag” at one end, which facilitates purification of the protein, *i.e.*, a purification tag. Such tags can also be used for immobilization of a protein of interest during the glycosylation reaction. Suitable tags include “epitope tags,” which are a protein sequence that is specifically recognized by an antibody. Epitope tags are generally incorporated into fusion proteins to enable the use of a readily available antibody to  
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thereof. A mcy

or reverse osmotic membrane as described in commonly assigned AU Patent No. 735695 may be used. As a further example, membrane filtration wherein the membranes have a molecular weight cutoff of about 1000 to about 10,000 Daltons can be used to remove proteins. As another example, nanofiltration or reverse osmosis can then be used to remove salts. Nanofilter membranes are a class of reverse osmosis membranes which pass monovalent salts but retain polyvalent salts and uncharged solutes larger than about 200 to about 1000 Daltons, depending upon the membrane used. Thus, for example, the oligosaccharides produced by the compositions and methods of the present invention can be retained in the membrane and contaminating salts will pass through.

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15        [0125] Suitable acceptor substrates used by the *H. pylori* fucosyltransferase proteins and methods of the invention include, but are not limited to, polysaccharides, oligosaccharides, lipids, and glycolipids. For example, the oligosaccharide LNNT can be fucosylated to form LNFIII. The fucosyltransferases described herein can also be used in multienzyme systems to produce a desired product from a convenient starting material. For example, LNFIII was  
20 prepared on a multigram scale from lactose using the *H. pylori*  $\alpha$ -1,3/4-fucosyltransferases from strain 1182 described herein, in combination with *Neisseria gonococcus*  $\beta$ -1,3N-acetylglucosaminyltransferase (lgtA) and *Neisseria gonococcus*  $\beta$ -1,4-galactosyltransferase (lgtB).

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tag is another commonly used epitope tag. Other suitable tags are known to those of skill in the art, and include, for example, an affinity tag such as a hexahistidine (SEQ ID NO:76) peptide, which will bind to metal ions such as nickel or cobalt ions. Purification tags also include maltose binding domains and starch binding domains. Purification of maltose binding domain proteins is known to those of skill in the art. Starch binding domains are described in WO 99/15636, herein incorporated by reference. Affinity purification of a fusion protein comprising a starch binding domain using a betacylodextrin (BCD)-derivatized resin is described in USSN 60/468,374, filed May 5, 2003, herein incorporated by reference in its entirety.

10           **G. Fucosyltransferase reactions**

[0127] The *H. pylori* fucosyltransferase proteins, acceptor substrates, donor substrates and other reaction mixture ingredients, including other glycosyltransferases and accessory enzymes are combined by admixture in an aqueous reaction medium. The medium generally has a pH value of about 5 to about 8.5. The selection of a medium is based on the ability of the medium to maintain pH value at the desired level. Thus, in some embodiments, the medium is buffered to a pH value of about 7.5. If a buffer is not used, the pH of the medium should be maintained at about 5 to 8.5, depending upon the particular glycosyltransferase used. For fucosyltransferases, the pH range is preferably maintained from about 6.0 to 8.0. For sialyltransferases, the range is preferably from about 5.5 and about 7.5.

[0128] Enzyme amounts or concentrations are expressed in activity units, which is a measure of the initial rate of catalysis. One activity unit catalyzes the formation of 1  $\mu\text{mol}$  of product per minute at a given temperature (typically 37°C) and pH value (typically 7.5). Thus, 10 units of an enzyme is a catalytic amount of that enzyme where 10  $\mu\text{mol}$  of substrate are converted to 10  $\mu\text{mol}$  of product in one minute at a temperature of 37 °C and a pH value of 7.5.

[0129] The reaction mixture may include divalent metal cations ( $\text{Mg}^{2+}$ ,  $\text{Mn}^{2+}$ ). The reaction medium may also comprise solubilizing detergents (e.g., Triton or SDS) and organic solvents such as methanol or ethanol, if necessary. The enzymes can be utilized free in solution or can be bound to a support such as a polymer. The reaction mixture is thus substantially homogeneous at the beginning, although some precipitate can form during the reaction.

tag is another commonly used epitope tag. Other suitable tags are known to those of skill in the art, and include, for example, an affinity tag such as a hexahistidine peptide, which will bind to metal ions such as nickel or cobalt ions. Purification tags also include maltose binding domains and starch binding domains. Purification of maltose binding domain proteins is known to those of skill in the art. Starch binding domains are described in WO 99/15636, herein incorporated by reference. Affinity purification of a fusion protein comprising a starch binding domain using a betacylodextrin (BCD)-derivatized resin is described in USSN 60/468,374, filed May 5, 2003, herein incorporated by reference in its entirety.

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20 [0128] Enzyme amounts or concentrations are expressed in activity units, which is a measure of the initial rate of catalysis. One activity unit catalyzes the formation of 1  $\mu\text{mol}$  of product per minute at a given temperature (typically 37°C) and pH value (typically 7.5). Thus, 10 units of an enzyme is a catalytic amount of that enzyme where 10  $\mu\text{mol}$  of substrate are converted to 10  $\mu\text{mol}$  of product in one minute at a temperature of 37 °C and a pH value of 7.5.

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